ONLINE EMBEDDED LIBRARIAN CASE STUDY: A DESCRIPTIVE EVALUATION

By

MARY EDWARDS

A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF EDUCATION

UNIVERSITY OF FLORIDA

2011

To my loving husband Eddie and beautiful daughters Allison and Samantha

ACKNOWLEDGMENTS

First and foremost I wish to express my utmost gratitude to my husband Eddie for his support during this extended journey. I could have never finished without his help, encouragement, and willingness to put up with a slightly messy house. I thank my daughters Allison and Samantha for their patience and understanding. I know they are just as happy (if not more so) as I am that I'm finally done. For Allison the novelty of doing her homework with mommy has long since worn off and now she just wants her mommy back. Samantha has never known her mommy not in school and will be pleasantly surprised with how much more fun mommy is now that the word "dissertation" is no longer in regular use in our home.

To the rest of my family - mom, Don, dad, Mona, Ariel, Janna, nana, Jolene, Ryan and Jimanie your support and encouragement has been invaluable. Dr. Kathryn Kennedy, I'm listing you with family because you have been supportive since day one of the Foundations of Educational Technology class fall 2006, when we both started on this path. You told me then that I could and would finish with a doctorate, and with your help, you were right. I can never repay you for the chocolate espresso beans and willingness to read my chapters no matter how busy you were with your own teaching and research! I think the phrase "I couldn't have done it without you" applies to you Kathryn.

My advisors Dr. Erik Black and Dr. Swapna Kumar have been amazingly supportive during this process. Their availability, encouragement, and feedback molded this project, the document, and me as a researcher/practitioner. I'll never forget Erik's comment to me during our first meeting spring of 2007 when he gave me a gentle shove in the direction of pursuing a doctorate; little did he know that he would become so

involved with my progress. Swapna, you have been both advisor and friend and I look forward to many future collaborations. I also thank my entire committee, Dr. Black, Dr. Kumar, Dr. Lombard, and Dr. Tennant. Your commitment to improving my work is greatly appreciated. While not on my committee, the entire Educational Technology department has been supportive of me and my work: Dr. Cavanaugh, Dr. Dawson, Dr. Ritzhaupt and Dr. Sessums – you have my sincerest gratitude.

My department chair and committee member, Dr. Michele Tennant has been unfailingly supportive of my desire to pursue this degree, even before she volunteered to serve on my committee the day before my proposal defense. I thank the rest of the Health Science Center Library faculty and staff, especially the Biomedical and Health Information Services department. Hannah Norton, your help with serving as a rater for my citation analysis and volunteering to proofread the whole document was invaluable. Kaitlin Blackburn, you have my utmost appreciation for proofreading my dissertation – I know you will go far in whatever you do. I also thank Dr. Randy Graff for auditing my coding and lending an ear. To my colleague and friend Marilyn Ochoa, thanks for working with me on the pilot project and supportively listening to my progress.

Last, but certainly not least I thank the others who have been helpful and understanding these last few years including the parents and teachers of Expressions Learning Arts Academy (especially Dr. Dave Price for his reminders that sleep is necessary) and my educational technology support group: Nicola Wayer, Ben Campbell, Vasa Buraphadeja, Feng Liu, Nate Poling, Irvika Francois, and Melissa Johnson. Finally, a special thanks to all of my EdD cohort colleagues and especially my support group, Polly Haldman, and Lisa Holmes.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ACRL   Association of College and Research Libraries

AHC   Academic Health Center

ARL   Association of Research Libraries

CMS   Course Management System

DCT   Dual Coding Theory

EBM   Evidence Based Medicine

EL   Embedded Librarian

HSC   Health Science Center

IL   Information Literacy

OL   Online Learning

SACS   Synchronous Audiographic Conferencing Software

SoTL   Scholarship of Teaching and Learning

Abstract of Dissertation Presented to the Graduate School
of the University of Florida in Partial Fulfillment of the
Requirements for the Degree of Doctor of Education

ONLINE EMBEDDED LIBRARIAN CASE STUDY: A DESCRIPTIVE EVALUATION

By

Mary Edwards

December 2011

Chair: Erik Black
Major: Curriculum and Instruction

The increase in online programs has been accompanied by the need for library instruction and support for online students. Students enrolled in off-campus and/or online programs have to be able to successfully access and use digital library resources to complete course requirements. Using and evaluating resources is an element of information literacy, a key component in critical thinking and lifelong learning, which is addressed by accrediting agencies. An embedded librarian project in an online graduate educational technology course demonstrated the feasibility of an embedded librarian for online graduate courses at the University of Florida, resulting in benefits for students and a pilot for this OnMed Embedded Librarian case study.

This case study describes the development and evaluation of an embedded librarian project for the OnMed program. OnMed is a Masters level graduate educational technology program aimed at equipping academic health care professionals with skills to teach and conduct educational research in the 21st century. The librarian was embedded in an eight week course, EDG 6931 – Issues and Current Research in Educational Technology. The results of paired pre- and post-assessment questionnaires, narrative reflections, and an instructor interview indicate that embedded

librarians can greatly help students in their online assignments; however, the specific features and design of the successful embedded librarian program should vary according to the context and learner characteristics. Course level embedded librarian programs such as the one described and evaluated in this case can have implications for the practice of librarianship, policy and administrative implications, and curricular implications. Further research and recommendations for the implementation and assessment of embedded librarian projects are discussed including the need for further studies to investigate course level embedded librarians in various contexts and the use of other methodologies to provider stronger empirical evidence to support the efficacy of embedding librarians in online courses.

CHAPTER 1
INTRODUCTION

Chapter 1 provides an introduction and framework for the embedded librarian program. The introduction highlights the need for library support and instruction for distance and online education in the context of prior research, introduces the researcher (including prior research, qualifications and niche), describes the project and context (including the purpose, research questions, methodology and design) and finally emphasizes the significance of designing and evaluating an online embedded librarian experience.

Background

As distance and online education enrollments continue to increase and the trend for growth in online learning continues, educators are challenged to ensure quality distance education experiences (Allen & Seaman, 2010; Accrediting Commission of the Distance Education and Training Council, 2010). For the past eight years, the Sloan Consortium has sponsored national surveys of online learning. According to these reports, there is a trend of significantly increasing enrollments in online courses (Allen & Seaman 2002; 2003; 2004; 2005; 2006; 2007; 2008; 2009). During the fall 2008 semester, over 4.8 million students took an online course, which was a seventeen percent increase from 2007 (Allen & Seaman, 2010). The newest report published in 2010 indicates "nearly thirty percent of all college and university students now take at least one course online" (Allen & Seaman, 2011, p. 2). While enrollments are increasing, faculty perception of the quality of online instruction is also increasing (Allen & Seaman, 2011). Sixty-six percent of faculty (specifically chief academic officers)

perceive the learning outcomes for online learning as "as good or better" than traditional face-to-face instruction (Allen & Seaman, 2010).

As distance education evolved technologically and pedagogically, it transitioned from the boundaries of educational legitimacy to its current status as a valid alternative and/or supplement to traditional higher education (Bruder, 1989; Casey, 2008; Garrison, & Shale, 1987; Gooch, 1998; Matthews, 1999; Means, Toyama, Murphy, Bakia, & Jones, 2009; Moore, & Kearsley, 2004; Schlosser, 1994). Support for distance education and online learning includes student, faculty, and library support (Bird & Morgan, 2003; Cain & Lockee, 2002; Carnwell & Harrington, 2001; Fisher & Baird, 2005; Kelly, 2001; Ludwig-Hardman & Dunlap, 2003; Rama & Hope, 2009; Simpson, 2002; Tait, 2000; Tait, & Mills, 2003; Thorpe, 2002; Wheeler, 2002).

Various factors contribute to quality assurance in distance education at the course, program, and administrative levels including faculty support (the use of instructional designers and technologists, etc.) and various levels of student support (Distance Education & Training Council, 2010). In terms of access to library materials, academic librarians can provide necessary support for both faculty and students, thereby contributing to a quality distance education experience and providing distance students with library services similar to those available to face-to-face students (Baird & Wilson, 2002; Black, 2003; Burge, 2002; Burge & Judith, 2000; Burich, 2004a; Burich, 2004b; Cassner & Adams, 2005; Coffman, 2001; Gandhi, 2003; Haynes, 2002; Lorenzo, 2003; Pace, 2001; Perrone, 2000).

The Association of College and Research Libraries (ACRL) emphasizes libraries' responsibilities to serve distance learners in their "Standards for Library Services to

Distance Learners" (ACRL, 2007). In addition to enumerating service (i.e. document deliver/interlibrary loan, reserves, etc.), personnel and policy requirements, the standards unequivocally state that students enrolled in distance education programs are entitled to the same library services as their face-to-face counterparts.

Evolving Roles of Librarianship

Steven Bell and John Shank coined the phrase "blended librarian" (p. 372), which emphasizes the evolving roles of librarianship and the need for librarians who are skilled in curriculum/instruction and educational technology (Bell & Shank, 2004; Shank, 2006). Librarian involvement with distance education expands upon the features of traditional academic librarianship, forging new roles as "blended librarians" and collaborative partners in teaching and learning (Bell, 2005; Bell & Shank, 2004; Shank, 2006; Sinclair, 2009). Blended librarians support the needs of distance education faculty, staff and students through their knowledge of instructional design, pedagogy/andragogy and technology (Bell & Shank, 2004; Shank, 2006).

While there are many professional development opportunities to assist librarians in gaining the knowledge, skills and attitudes described by Bell and Shank, there is a need for a subset of the "blended librarians" to have a strong background in theory and research in order to lead professional development in blended librarianship acquired through advanced graduate study (Shank, 2006). As a librarian and doctoral candidate studying educational technology, the author, heretofore referred to as the librarian researcher, exemplifies the concept of "blended librarian" and leads the profession by contributing to and strengthening the quality of scholarship on library roles in instruction. In addition to holding an American Library Association (ALA) accredited Master's Degree in Library and Information Science, the librarian researcher has six years of

professional library experience and five years of advanced graduate coursework in curriculum and instruction (including educational technology, instructional design and learning theories).

Online library instruction bridges the academic disciplines of library and information science and educational technology (Johnson, 2008). Therefore, in addition to the more traditional areas of library instruction and information literacy, librarians providing support to online programs should be knowledgeable about significant issues in distance education and online teaching and learning (Cassner & Adams, 2004, 2006; Fritts & Casey, 2010; Johnson, 2008; Jones, 2007, 2003; Washburn, 2007; Yang, 2005).

Library Support for Distance Education

Library support for distance and online learning and the benefits of such support for students and faculty are well documented in the library and information science literature (Baird & Wilson, 2002; Black, 2003; Burge, 2002; Burge & Judith, 2000; Burich, 2004a; Burich, 2004b; Cassner & Adams, 2005; Coffman, 2001; Gandhi, 2003; Haynes, 2002; Lorenzo, 2003; Pace, 2001; Perrone, 2000; Ramadevi, 1999). Providing additional evidence of learning outcomes (through assessment efforts described in the literature and in this embedded librarian project) can help ensure future library involvement with distance and online education and enhance quality assurance by providing empirical evidence for evidence based librarianship (Birdsall, 2008; Bogel, 2008; Brettle, 2008; Glynn, 2008; Helliwell, 2007; Loertscher, 2009; Lyons, 2009; Mirijamdotter, 2009; Nobisso, 2008; Todd, 2008; Wakimoto, 2010). Evidence based practice is a trend towards data based decision making in many professions including librarianship, education, medicine and other health professions (Johnson, 2008).

Types of Online Library Instruction

There are two broad categories of library instruction: stand-alone instruction that occurs free of any ties to a particular course or curricula and course integrated instruction that is contextualized and designed to supplement coursework (Allegri, 1985; Badke, 2009; Beile, 2003; Bordonaro & Richardson, 2004; Cmor & Marshall, 2006; Mellon, 1984; Stein & Lamb, 1998). Library instruction for distance education includes both stand-alone and course-integrated instruction (Cipkin, 2002; Jobe & Deborah, 2000; Markgraf, 2004). An examination of the literature reveals that librarians use multiple modes to provide library instruction for distance education (Arnold, & Jingping, 2002; Dunlap, 2002; Fourie, 2001; Garnsey, 2002; Henner, 2002; Holmes, 2002; Hricko, 2001; Jayne, 2000; Kinder, 2002).

Stand-alone library instruction for distance and online instruction focuses on online tutorials and other instructional content not developed to support a specific course (Churkovick & Oughtred, 2002; Ferguson & Ferguson, 2005; Lindsay, Cummings, Johnson, & Scales, 2006; McLean & Dew, 2006; Orme, 2004). Course integrated library instruction can include integration in the course management system, synchronous instruction (using video conferencing or synchronous audiographic conferencing tools) and, more recently, online embedded librarians (Cipkin, 2002; Jobe & Deborah, 2000; Markgraf, 2004; Moore, 2004; Ramsay & Kinne, 2006; Kearley & Phillips, 2004). The library literature supports the fact that library instruction is most effective when students are directly applying the content to an assignment (Badke, 2009; Stein, 1998) because the instruction is contextualized to the needs of a particular course or assignment.

Embedded Librarians

Various levels of course and program integration exist within online library instruction, including what many librarians refer to as an "embedded librarian" model (Kesselman & Watstein, 2009; Rudin, 2008). The term "embedded" seems to have been borrowed from the practice of embedding journalists in combat zones during recent military conflicts (Dugan, 2008; Kesselman & Watstein, 2009). Embedded librarianship will be thoroughly discussed in the literature review, but defined generally an embedded librarian is thoroughly integrated into the college, department, and courses he/she serves and provides contextualized support and instruction. As noted by Edwards, Kumar, and Ochoa (2010) the theoretical basis for the course level online embedded librarian is founded in the theories of contextualized instruction (Brown, Collins & Dugid, 1990), authentic instruction (Collins, Brown & Newman, 1989) and Moore's distance education theories of transactional distance and interaction in distance education (Moore, 1989 &1993). Additional conceptual support for the embedded librarian project is founded in the concept of applying an instructional design model (specifically the Morrison, Ross, and Kemp model 2006) to the development of the library instruction that serves as the instructional intervention used in the study. The embedded librarian project described in this document was based on prior education research and best practices in library instruction for distance and online education.

Previous Related Research

The project is based on the findings of earlier research including pilot studies completed in the areas of assessing online-embedded librarians and using synchronous audiographic tools to provide synchronous library instruction to professional students enrolled in a graduate educational technology program. The written documentation of

those projects was submitted in partial fulfillment of the librarian researcher's qualifying examination. Both projects were piloted with online graduate level educational technology students in collaboration with the education librarian.

Synchronous instruction is used in online learning but is not thoroughly documented or evaluated in the library literature (Bell & Shank, 2006; Blakeslee & Johnson, 2002; Henning, 2001; Kontos & Henkel, 2008; Reeves, 2005). A pilot project allowed the librarian and researcher to investigate the use of Elluminate to provide synchronous online library instruction. The project was evaluated with a post instruction survey, but due to several issues with the assessment instrument and methodology, the data was of little use. However, the anecdotal findings indicated that given careful preparation and topic selection, synchronous instruction via Elluminate is a viable platform for providing online library instruction, and the overall experience (from both the librarian and student perspective) informs future work in this area. Based on an identified gap in the literature it can be concluded that there is a need to further implement and assess online synchronous library instruction for satisfaction and learning outcomes.

Exploring another type of integrated online library instruction was the goal of the embedded librarian pilot. The concept of the embedded online librarian was first explored and evaluated in a pilot project that involved collaboration between the education librarian, the course instructor and the librarian researcher. Results from that project indicate that students and faculty found both the presence of a librarian and integrated library content useful. While the embedded librarian pilot was a successful first step, it did not evaluate the librarians' impact on student learning. Lessons learned

from both pilot projects informed the design and evaluation of this embedded librarian project.

<div align="center">**The Project**</div>

Purpose

The purpose of this project was to not only develop an embedded librarian program (focusing on instruction) but to also develop a comprehensive evaluation plan to assess program success and determine its effect on student learning. As was established in the above discussion of the evolving nature of librarianship and distance education, contextual library support of distance education was essential. While librarians are acknowledging this need by creating online embedded librarian programs, there is still a need to evaluate and provide empirical evidence as to the efficacy of such endeavors. This project has not only filled an important instructional need, it has also demonstrated a comprehensive evaluation plan and guide for future work in the development and assessment of online embedded librarian programs.

Research Questions

The primary research question guiding this project was: How does the presence of an online embedded librarian influence graduate students' experience in an online educational technology research class as defined by these specific aspects:

- Self-efficacy with information literacy and library skills as measured by changes in performance on a pre and post assessment

- Library skill performance as measured by changes in performance on a pre and post assessment

- Quality of graduate students' research as measured by the quality of citations in an annotated bibliography

Exploring these questions will provide the evidence for future online-embedded librarians and further integration collaboration between librarians and faculty.

Methodology

All of the participants in this case study are members of the inaugural cohort of the OnMed program. The OnMed program was designed to provide faculty in the health science colleges with a Masters of Education focusing on Educational Technology. The goal of the program is to equip participating practitioners with the knowledge and skills necessary to utilize technology in their clinical teaching areas (Cavanaugh, Dawson & Black, 2010). The needs of the OnMed students included both medical education and educational technology literature and resources. This new program provided an excellent fit for the librarian researcher because it required a blend of her developing expertise in the field of educational technology with professional experiences as a health science librarian in an academic medical center.

Prior research provided valuable insight into the methodologies employed in the evaluation of this embedded librarian project. Two relevant areas included assessing self-efficacy with information literacy/library skills and citation analysis as an outcome measure for student library skills.

Both qualitative and quantitative methods provided a complete picture of the impact of the embedded librarian program. Quantitative assessments included a paired pre/post-assessment of self-efficacy with information literacy and library skill performance and citation analysis of student writing artifacts to evaluate the quality of citations students use (an indirect measure of their research skills). Students' perceptions of the program (from narrative reflections) provided qualitative data and

were triangulated with the quantitative data to provide a complete program evaluation of the OnMed case.

Design

Consistent with the Morrison, Ross, and Kemp (2006) instructional design model, the exact configuration of the instructional components that comprised the embedded librarian experience were designed and developed after a full analysis of the learners, context and tasks required of the students. The learner analysis was informed by the OnMed survey of technology use and collaboration/consultation with the course instructor. For the OnMed students, the instructional goals focused on increasing students' library and information literacy skills in the areas of medical/health science education and educational technology. The library instruction included foundational, "core" concepts relevant to the program as a whole, and other topics specific to the needs of the course. Library content for the course focused on optional asynchronous interaction via the discussion board, optional synchronous help facilitated through the integration of a Meebo chat widget and instructional content. Instructional materials included several instructional websites (called LibGuides), asynchronous presentations, and instructional videos.

<div align="center">

The Researcher

</div>

The embedded librarian project provided evidence of the librarian researcher's teaching as she employed an instructional design approach to create an instructional plan, developed instructional materials and integrated herself in the OnMed course. By conducting a rigorous evaluation of the program, the librarian researcher demonstrated expertise in the areas of research and scholarship of teaching and learning. The project coincided with her professional responsibilities as an academic medical librarian

specializing in distance education and liaising to departments in the colleges of Medicine and Public Health & Health Professions at the University of Florida.

Within the librarian researcher's professional role, her expertise in educational technology has facilitated service opportunities within the university libraries, in the Health Science Center, on campus, and nationally. Two relevant and significant committees include the Academic Health Center Faculty Development Workgroup and the Academic Health Center Educational Technology Advisory Council. Her participation in those groups is beneficial both to the library, to the committees on which the librarian researcher serves, and to the Health Science Center at large. Benefits to the libraries include participation in discussions significant to the future of the health science center and the establishment of the libraries' contribution to academic health education. The HSC Library is in a unique situation as a neutral entity providing service to all HSC college without having ties to a specific college. This neutrality is beneficial to the HSC and the committees on which the librarian researcher serves because she is able to provide valuable input while remaining objective.

Significance of the Project

The need for library support of distance and online learning is well established in the literature (Baird & Wilson, 2002; Black, 2003; Burge, 2002; Burge & Judith, 2000; Burich, 2004a; Burich, 2004b; Cassner & Adams, 2005; Coffman, 2001; Gandhi, 2003; Haynes, 2002; Lorenzo, 2003; Pace, 2001; Perrone, 2000; Ramadevi, 1999). Libraries use a variety of methods to provide support and instruction, including established embedded librarian programs and services (Moore, 2004; Ramsay & Kinne, 2006; Kearley & Phillips, 2004).

In order to demonstrate the continued need and benefits of these programs existing and new services must be evaluated. To date there is no documentation of a thorough and rigorous evaluation of an online-embedded librarian program demonstrating a clear impact on student performance. Completing such an evaluation provided evidence for the continuation and expansion of embedded librarian programs in the Health Science Center and in a broader context at the University of Florida. Additionally, the results of this project have implications for library support of online learning. As such, the written documentation of the project contributes to the body of library science literature by describing and providing evidence to support the practice of providing contextual instruction for online and distance education and providing practicing librarians with a model for thorough and valid research and assessment practices.

CHAPTER 2
LITERATURE REVIEW

Introductory Remarks

As previously stated the context, niche and methodology for this embedded librarian project are grounded in the educational technology and library science literature. The two main ideas present in this project relate to library instruction/information literacy and distance and online education. Both concepts provide foundational support for online library instruction in general and specific support for embedded librarianship. Boote and Beile (2005) emphasize the "centrality of the literature review" in preparing for graduate level research, especially as it relates to doctoral study (p. 3). To this end, this chapter will focus on an in-depth exploration of the relevant literature. The following literature review includes four main sections - Supporting Distance Education, Library Instruction and Information Literacy, Library Instruction for Distance Education, and Embedded Librarianship – with subsections as needed.

The first section (Supporting Distance Education) introduces the topic of support for distance and online education including discussion of the growth in distance and online education, student and faculty support, and concludes with a discussion of general library support. Section two (Library Instruction and Information Literacy) reviews the literature on information literacy and library instruction. It is important to discuss this concept prior to discussing library instruction for distance education for several reasons. First, library instruction and information literacy are central themes for the project. Second, traditional information literacy instruction preceded and informed library instruction for distance and online education. Section three (Library Instruction for

Distance Education) focuses on library instruction for distance education, and the articles are categorized by whether they describe stand-alone or course integrated instruction. The final section (Embedded Librarianship) provides an in-depth discussion of relevant embedded librarian literature, which directly informs the design of the embedded librarian project described in this document.

Supporting Distance Education

Growth & Trends in Distance & Online Education

Distance Education has evolved from the early days of correspondence courses via mail, radio, television, and videoconference (Casey 2008; Moore & Kearsley, 2005). Advances in technology have facilitated growth in distance education: "the significant parallels between the development of distance learning and the expanding role of technology in mass communication suggest that technology is the most compelling developmental factor" (Casey, 2008, p. 45). As distance education expands, it continues to gain acceptance as a legitimate educational option. The Internet has become a nearly ubiquitous technology, and the scope of distance education opportunities has shifted in favor or web based courses and online learning. Lee and Nguyen (2007) provide a thoughtful and thorough review of the literature, highlighting key articles on the growth and evolution of online learning.

Since 2002, the Sloan Consortium has funded an annual report on the growth of online education. The most recent report (Allen & Seaman, 2009) describes the growth of online learning and factors influencing its success. Research questions guiding the 2009 study included issues investigating the growth of and support for online learning: How Many Students are Learning Online, Is Online Learning Strategic, Has Faculty Acceptance of Online Learning Increased, and Do Faculty Receive Training for

Teaching Online? Answers to these research questions provided useful insight into the online learning environment, with recommendations and directions for institutions of higher education.

Quality assurance and acceptance (by the public and those involved in higher education) of online education is an issue addressed thoroughly in the literature. Additionally, the literature is replete with studies (utilizing primarily experimental and controlled quasi-experimental designs) comparing the effectiveness of online (or hybrid/blended) instruction and traditional classroom instruction. A 2009 meta-analysis from the U.S. Department of Education examined the literature regarding the quality of learning in online and hybrid (or blended) courses (Means et al., 2009). This analysis found slightly increased learning outcomes from purely online learning (compared to face-to-face instruction) and that blended instruction resulted in significantly increased learning outcomes (compared to both traditional and online only instruction). Meta-analyses are included with systematic reviews as the highest (and most rigorous) level of evidence (Bangert-Drowns, 1986; Bangert-Drowns & Rudner, 1991; Glass, McGaw & Smith, 1981; Hoffert, 1997; Hunter & Schmidt, 1990; Kulik & Kulik, 1989), and as such, the conclusions from the Means et al.. study are a significant contribution to the field.

There are many factors influencing the quality of online learning including the level of institutional support for both students enrolled in online courses and faculty members providing online instruction. To this end, the next section of the literature review discusses the literature concerning support for distance education and online learning.

Need for library support in Distance Education

Supporting distance education is a complex administrative issue and while administrators should consider issues in all areas, instruction is still the focus and

ensuring academic quality is paramount. The extraordinary growth in online learning noted in Allen and Seaman (2010) indicates that students are flocking to pursue online educational opportunities. Now that students are viewing online learning as a viable alternative to face-to-face courses, universities must shift focus from marketing online learning to fully supporting the needs of online students. Student affairs' support of traditional college students has been covered extensively in higher education literature (Cook, 2009). Support for distance education students is an emerging topic of research (Husmann & Miller, 2001; LaPadula, 2003; Levy, 2003; Levy & Beaulieu, 2003; McLendon & Cronk, 2003; Peters, 1998; Visser & Visser, 2000). Key topics in this burgeoning research area focus on the link between student perceptions of connectedness (both with other students and the institution); retention, completion, and satisfaction; and developing and fostering a sense of community (Cain & Lockee, 2002; Kelly, 2001; Tait, & Mills, 2003). Dare, Zapata, & Thomas (2005) surveyed and compared distant and campus based students regarding a variety of issues including their relative experiences, perceptions of support needs, and use of and satisfaction with existing programs and services. The researchers found a gap between the experiences and satisfaction of campus based and distant students, indicating a need for student support services to target distant students.

In addition to technology and pedagogical support, institutional support for distance education should include library support. The library can (and should) play a key role in supporting the needs of both faculty and students involved in distance education (ACRL 2007; ARL, 2005; Baird & Wilson, 2002; Black, 2003; Burge, 2002; Burge & Judith, 2000; Burich, 2004a; Burich, 2004b; Cassner & Adams, 2005; Coffman,

29

2001; Gandhi, 2003; Haynes, 2002; Lorenzo, 2003; Pace, 2001; Perrone, 2000; Ramadevi, 1999). Libraries are using a variety of methods to provide support and instruction, including establishing embedded librarian programs and services (Kearley, & Phillips, 2004; Moore, 2004; Ramsay & Kinne, 2006). The next sections of the literature review describe the ways in which libraries are supporting distance education and how this project fills a need for increased contextualized online library instruction.

Distance education support is a growing area of research and institutional administrators are, for the most part, aware of the need for supporting faculty and students (Bird & Morgan, 2003; Cain & Lockee, 2002; Carnwell & Harrington, 2001; Fisher & Baird, 2005; Kelly, 2001; Ludwig-Hardman & Dunlap, 2003; Rama & Hope, 2009; Simpson, 2002; Tait, 2000; Tait & Mills, 2003; Thorpe, 2002; Wheeler, 2002). Library support for distance education is a topic thoroughly discussed in the library and information science literature. To acknowledge the need for library support of distance education, the Association of College and Research Libraries (ACRL) created a set of standards: the Standards for Distance Learning Library Services (ACRL, 2007). The current iteration of these standards has evolved from a set of guidelines documented in 1963 to the most recent 2008 version. A defining facet of the ACRL Standards is the "Access Entitlement Principle," which states unequivocally that all members of the university community are entitled to equal access to library resources and services regardless of location and proximity to campus.

The Standards document is founded on the access entitlement principle and describes specific elements necessary to fulfill the principle. Examples include accessible interlibrary loan and document delivery services, electronic materials (books,

journals, and databases) and access to instruction and reference services. In addition to the ACRL Standards, there are several professional organizations and conferences dedicated to the provision of library services for distance learners the most prominent of which include the Distance Learning Section (DLS) of the ACRL and the Off-Campus Library Services Conference (OCLSC). The key professional library journal dealing with distance education is the Haworth Press' *Journal of Library Services for Distance Learning*. Librarians serving significant populations of distance learners should keep up to date with the issues and current research in the field through professional participation and scholarship.

Library Instruction and Information Literacy

Prior to discussing library instruction for distance and online education, it is necessary to provide background and context of library instruction and information literacy in general. This overview includes a brief introduction to information literacy, a discussion of library information literacy instruction, and an examination of the connection between self-efficacy and information literacy.

The Association of College and Research Libraries defines information literacy as "the set of skills needed to find, retrieve, analyze, and use information" and "a set of abilities requiring individuals to 'recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information"(ACRL, 2005). ACRL further expanded this definition of information literacy and developed a set of competency standards to delineate what an individual needs to be able to do to be considered information literate. The five standards include performance indicators and outcomes. In addition to the operational definition of information literacy presented by the ACRL, Livingstone, Van Couvering, and Thumin present a practical definition that

31

extends beyond the confines of higher education into the realm of society and citizenship: "The information literate person is able to participate in the world of work…by being an information worker or knowledge worker" (Livingstone & Thumin, 2008 in Corio, Knobel, Lankshear & Leu, 2008, p. 110).

The role of libraries and librarians in information literacy has become a defining characteristic of academic librarianship; Marcum (2002) characterizes information literacy as "a major focus and purpose of librarianship" and an endeavor that has been years in the making (p. 1). Librarians have accepted the banner of information literacy and transformed library instruction to include information literacy concepts in addition to traditional bibliographic instruction (Grassian, 2004; Thompson, 2002).

Neely (2000) describes gaps in information literacy research surrounding psychological and social aspects. Self-efficacy could be an important factor that influences information literacy and library skills (Kurbanoglu, 2003). The following section discusses the theoretical underpinnings of self-efficacy and its relationship to information literacy and library instruction.

Self-efficacy describes an individual's confidence in their ability to perform specific tasks (Bandura, 1977; Kear, 2000). Self-efficacy was initially described by Bandura (1977) as a component of his social cognitive learning theory, and according to Pajares, (2006) Bandura remains the most prominent researcher studying the concept. Two significant characteristics of self-efficacy relate to the embedded librarian project. Firstly, self-efficacy is context specific and can vary in specific domains. Secondly, self-efficacy is positively linked to performance (Bandura, 1986).

These two aspects of the concept of self-efficacy relate to self-efficacy with library skills and information literacy. There is a noticeable lack of published research on self-efficacy and information literacy, with few studies considering all aspects of information literacy; an in-depth literature search revealed only five articles on the topic (Beile & Boote, 2005; Fletcher, 2005; Kurbanoglu, 2003; Kurbanoglu, Akkoyunlu, & Umay, 2004; Monoi, O'Hanlon, & Diaz, 2005; Ren, 2000). Therefore, it is necessary for an evaluation of the embedded librarian project to include measures of self-efficacy to attempt to both investigate the psychological and social aspects of information literacy and fill a gap in the literature.

Library Instruction for Distance Education

Library services are an essential component of support for distance education (Bird & Morgan, 2003; Cain & Lockee, 2002; Carnwell & Harrington, 2001; Fisher & Baird, 2005; Kelly, 2001; Ludwig-Hardman & Dunlap, 2003; Rama & Hope, 2009; Simpson, 2002; Tait, 2000; Tait & Mills, 2003; Thorpe, 2002; Wheeler, 2002). The focus of this project, online embedded librarianship for the OnMed program, necessitates an in depth discussion and evaluation of the literature related to library instruction for distant learners. To that end, the following section examines various modalities for providing library instruction to distance students in the context of stand-alone or course integrated instruction.

Stand-Alone Library Instruction for Distance Education

Stand-alone instruction occurs free of any ties to a particular course or curricula. Several of the articles reviewed described a multi-pronged approach to providing stand-alone library instruction to distance learners (Ferguson & Ferguson, 2005; McLean & Dew, 2006; Lindsay, Cummings, Johnson & Scales, 2006).

In 2005, Ferguson and Ferguson discussed the information literacy efforts of Charles Stuart University, an Australian institution comprised of a large proportion of distance learning students. The university library explored email reference and instruction and online tutorials. They integrated each within the curricular structure but without customizing them for curricular outcomes or for particular courses. While each of the instructional tools is discussed in detail, the authors include no evaluation or assessments and make no conclusions as to their success. McLean and Dew (2006) reported on strategies employed by libraries to provide library instruction to distant students primarily focusing on the use of asynchronous library tutorials distributed via CD-ROM.

In 2006 Lindsay, Cummings, Johnson and Scales of Washington State University used a variety of criteria to assess several of their library online instructional materials. The librarians developed assessments for various tutorials including text-based, virtual tour, and animated tutorials. The results of the assessments indicate that the tutorials increase student confidence with the materials they cover. However, the quizzes at the end of the assessment showed that although confidence levels increased, student performance and ability to demonstrate skills was poor even after completing the tutorials.

Much as online learning has evolved, online library instruction has evolved from linking to handouts, online pathfinders and web quests, to the development of a variety of online tutorials. Unlike much of the other online library instruction literature, many of the articles dealing with online tutorials consistently include assessment efforts with detailed descriptions of research methodologies.

One of the higher quality examples of assessing online library tutorials is evident in the work of Churkovick and Oughtred (2002). The librarians at Deakin University in Australia compared learning outcomes between one of their online tutorials (Smart Searcher) and face-to-face library instruction. The assessment instrument included questions relating to confidence with information literacy skills and a multiple-choice quiz to test information literacy proficiency. Quizzes were administered pre- and post-instruction. The assessment results indicated that post-test scores improved considerably regardless of instruction method, but scores were higher for face-to-face instruction than for the online tutorial. Analysis showed a significant difference between the methods of instructional delivery. Using the data collected, the authors assert that "traditional" face-to-face library instruction is preferred to online instruction, and teaching efforts will focus on face-to-face instruction accordingly.

The Texas Information Literacy Tutorial (TILT) was one of the first online, interactive, comprehensive information literacy tutorials in the United States. After the tutorial was launched, university libraries nationwide either linked directly to the tutorial or modified it for their own libraries. As this tutorial was widely used, it was imperative to evaluate its effectiveness. Orme (2004) studied TILT by dividing participants into cohorts: one cohort was assessed with no information literacy instruction, one cohort participated in only face-to-face instruction, one cohort completed TILT, and the last cohort completed both instructional formats. The author of this study took a novel approach to assess learning. Rather than testing students' skills and knowledge shortly after completion of the instruction, the librarians tested the students the semester after instruction occurred. The purpose of waiting was to determine if persistent learning

occurred or if the learning were superficial and limited to the semester in which the instruction took place. Results indicated that TILT instruction was as effective as traditional face-to-face instruction.

Continuing to develop and assess stand-alone library instruction for distance and online learning will help librarians provide a comprehensive instruction program regardless of the format of educational delivery. However, while both of these studies report findings from well-designed studies, a wealth of education research indicates that when comparing instructional delivery types, such as comparing face-to-face and online instruction, there is usually a finding of no significant difference (Russell, 1999). In light of the no-significant-difference debate, (Clark, 1983; Kozma, 1991) the results from these and similar studies should be thoroughly evaluated. Therefore, assessing the impact of stand-alone online library instruction should focus on evaluating efficacy rather than comparing delivery methods; a more valid research question would investigate the difference in instructional design methods rather than delivery mediums.

Course Integrated Library Instruction for Distance Education

Course integrated instruction is contextualized and designed to supplement coursework. Library research supports the need for course integrated, contextualized instruction (Badke, 2009; Stein, 1998). The theories of situated cognition (Brown, Collins & Dugid, 1989) and cognitive apprenticeship (Collins, Brown & Newman, 1990) provide the theoretical basis for the above findings regarding contextualized library instruction. Situated cognition describes the need for instruction to be tied to authentic activities and environments to facilitate knowledge acquisition, application and synthesis (Collins, Brown & Dugid, 1989). Cognitive apprenticeship is conceptually similar to situated cognition and refers to the need for instruction to be integrated into authentic

activities (and their appropriate social context) to further equip learners with the functional knowledge appropriate to disciplinary domains (Collins, Brown & Newman, 1990). By applying these theoretical constructs to library instruction, it can be concluded that librarians must integrate the principles of information literacy and library/research skills to the course and/or curriculum and connect them to specific products and assignments for library instruction (regardless of delivery format) to have maximum efficacy.

In the context of distance and online learning, course integrated instruction includes integration into the course management system, synchronous instruction, and more recently, online embedded librarians. Librarians providing course integrated instruction to distant or online students are using one of the previously mentioned modalities or combining modalities. For example, Librarians at Nova Southeastern University attempted three types of instruction: asynchronous (via streaming media), synchronous (via compressed video and NetMeeting), and blended (via WebCT). The authors describe their experiences with providing instruction to remote sites using compressed video and comment that this method was unsuccessful due to logistical and technical concerns, but offer no evaluative data to support their conclusions. Synchronous instruction with NetMeeting was more successful, and the authors collected data from their trials to support its continued use.

Many of the 4.6 million online students (Allen & Seaman, 2011) are taking courses supported by the expanding course management industry. Key players in this field include Sakai, Moodle (both open source products), Desire2learn, Angel, and Blackboard Learn$_{TM}$ (all proprietary products). One trend identified regardless of the

37

platform is the increasing presence of librarians and libraries within the course

management systems (CMS) (Cipkin, 2002; Jobe & Deborah, 2000; Kearley & Phillips,

2004; Markgraf, 2004; Moore, 2004)**.**

Library integration into CMSs ranges from including library links, to monitoring a

library related discussion board, and in some cases offering library specific credit

bearing courses. Tunon (2002) describes her experiences with a research literacy

course for Education Doctoral Students in a distance education program and compares

the online course with a face-to-face version. Both courses focused on teaching

students how and when to find information for their literature reviews, and instructional

topics included using subscription electronic databases and indices, free Internet

resources and print resources. The online course was conducted through WebCT, the

university's preferred course management system. Feedback indicates that while library

content was beneficial to doctoral students, the amount of work required to participate in

a course was more than the single credit hour earned.

Libraries have been providing course integrated synchronous instruction to remote

and off campus learners for years, primarily face-to-face (by traveling to remote sites) or

through various types of video conferencing (Chakraborty & Victor, 2004; Dunlap, 2002;

Henner, 2002; Hricko, 2001; Sochrin, 2004). New technologies provide new

opportunities for synchronous instruction to distance students. While the education

literature is replete with articles describing web based synchronous communication for

distance education (Anderson & Garrison, 1995; Finkelstein, 2006; Hampel, 2003 &

2006; Macdonald, 1998; Schullo et al., 2005), the library literature is bereft of literature

on the topic. The few articles dealing with online synchronous communication in

libraries were describing the use of tools for purposes other than instruction (primarily to facilitate virtual reference). One of the only clear examples of using synchronous audiographic tools for library instruction is illustrated in Kontos and Henkey (2008). The authors discuss Regent University's implementation of synchronous online library instruction, identify strengths and weakness of the platform, and provide standard tips for librarians wishing to use this tool for library instruction. More research is needed to evaluate the usefulness and efficacy of providing synchronous library instruction via synchronous audiographic tools.

One incarnation of online embedded librarianship is a form of course integrated instruction that utilizes many of the stand-alone and integrated instructional components discussed above, including online tutorials, integrating into the course management system, and synchronous instruction.

Embedded Librarians

As previously discussed, online embedded librarianship is an emerging service and is being reported with increasing frequency in the literature. While the focus of this project is on embedded librarians in curricular contexts, the phrase "embedded librarian" has a variety of meanings including librarian involvement and integration at the macro (college, department, program, research team) and micro (course) levels. Regardless of the variety of meanings, the term "embedded librarian" describes an intense integration of a librarian into the learners' environment at various levels (Bozeman & Owens, 2008; Edwards, Kumar & Ochoa, 2010; Dewey, 2004; Dugan, 2008; Freiburger & Kramer, 2009; Hall, 2008; Lillard, Norwood, Wise, Brooks & Kitts., 2009; Kesselman & Watstein, 2009; Matthew & Schroder, 2006; Rudin, 2008; Shumaker & Talley, 2009; York & Vance, 2009). While various models of embedded librarianship are described in the

literature (including librarians integrated into research teams and the clinical environment), this project focuses on librarians embedded granularly at the course level.

Edwards, Kumar & Ochoa (2010) provide a detailed literature review in their article discussing the assessment of an online embedded librarian project for graduate students enrolled in educational technology. In their mixed method assessment, the authors found that while the presence of an online embedded librarian was beneficial for both students and faculty, more detailed and rigorous assessment efforts are required. The identified need for additional research is directly addressed by this project, specifically regarding evaluating and comparing the quality of student artifacts. The articles in this section of the literature review focus on librarians embedded into online courses, as that is the focus of the embedded librarian project described in this document.

An in depth literature review of articles discussing librarians embedded into online courses is covered in York and Vance (2009). The authors performed a literature review and surveyed librarians to develop their best practices. The survey consisted of a 21-item questionnaire distributed to librarians via professional lists. Through the resulting analyses, York and Vance developed seven recommendations for librarians providing embedded librarian services in online courses. Three recommendations highlight the significance of a working relationship with the CMS (Course Management System) administrator, having a permanent link to the library in the CMS, and going beyond that library link. Other best practices include avoiding overextending the librarian, selectively

choosing courses that will reap the maximum benefit from the experience, actively participating in the class, and marketing the service to other faculty members.

As indicated in the literature, it is clear that embedded librarianship is an area libraries are exploring with generally positive feedback. Lillard (2009) took a novel approach to training future librarians for their roles as potential embedded librarians by embedding library science graduate students into online graduate courses. The library science students received course credit for their participation in the project by enrolling in a special topics course and acting as embedded librarians for distance nursing students. The student librarians collaborated with the course faculty members prior to the start of the course to discuss their level of participation. (Lillard et al., 2009, p. 14) This experience working with faculty provided the nascent librarians with important collaborative experience and reinforced the significance of working with faculty members. Student embedded librarians were allowed varying levels of involvement in the courses in which they were embedded, ranging from complete immersion and relative freedom to contact students, to a more conservative approach.

There were two aspects to the feedback for Lillard et al.'s project: feedback from the nursing students regarding their embedded librarian experience and feedback from the library students regarding their perceptions. The nursing students had generally positive feedback and reported that the usefulness of the embedded librarian was related to the course topic and how far along in their program the course occurred. Several students indicated that the instruction and embedded librarian experience would have been more beneficial if it had been offered earlier in their program. The embedded student librarians perceived the experience as helpful for their graduate

library education and had mixed reflections. Not surprising, library students who were allowed more freedom and contact with their nursing student patrons reported higher levels of satisfaction with the experience. Lillard et al. have utilized feedback to implement changes and are planning the second semester of the project (2009). Design and implementation information from the embedded librarian projects described above directly influenced the embedded librarian project being evaluated in this document.

It is clear from the literature that librarians are investigating innovative methods to provide library instruction to support online and distance education. However, general trends in the library instruction literature include a noticeable gap in the research; there is a lack of valid research practices and assessment. Generally the articles focus on implementation and are lacking in rigorous assessment of the discussed instruction (Behr, 2004; Ferguson, 2005; Kontos, 2008, etc). Assessment is crucial because librarians must be able to evaluate the effectiveness of their instruction to demonstrate alignment with accepted standards, such as the ACRL Information Literacy Standards (ACRL, 2000). The lack of assessment noted in the literature searches for this project emphasize the need for a valid, multi-faceted assessment approach to demonstrate the impact of the embedded librarian.

CHAPTER 3
METHODOLOGY

Introductory Remarks

Drawing upon the literature and prior research presented in chapter two, the

embedded librarian project is described in this section. Elements of the methodology

section include a review of the relevant methodology literature, a description of the case

including the setting, participants, design of the embedded library content (focusing on

the instructional design), and description of the theories influencing the instructional

design of the materials. The chapter concludes with a detailed description of the

research design, data analysis, and validity. As with all human subject research at the

university, the research protocol was submitted and approved by the Institutional

Review Board (IRB 02 for non-medical research – U-405-2011).

Methodology Review

The instructional intervention used in this study (the embedded librarian

experience) was evaluated and described using a mixed methods case study approach

including pre- and post-tests (of self-efficacy with library skills and library skills

performance), log data analysis, citation analysis to evaluate the quality of the sources

used in the participants annotated bibliography assignments, qualitative analysis of

narrative reflections, and a post-course interview with the instructor. The following

literature review will describe studies employing similar methods, and when possible,

make connections to the evaluation of the embedded librarian project.

Assessing Self-Efficacy

As mentioned previously, there is a lack of research in the area of assessing

library skills/information literacy self-efficacy. Two studies describe the development of

validated instruments to measure self-efficacy of information literacy (Kurbanoglu, Akkoyunlu & Umay, 2004; Monoi, O'Hanlon & Diaz, 2005), and two discuss evaluation of self-efficacy of information literacy as a component of a larger project (Beile & Boote, 2005; Fletcher, 2005; Ren, 2000). Because the use of a reliable, validated instrument decreases the chances for error in a study and increases the overall validity (Seliger & Shohamy, 1989), the validated instruments will be discussed in detail. In 2004 Kurbanoglu et al.. first created and validated a forty-item questionnaire (alpha reliability coefficient = 0.78) and then developed a shorter seventeen-item instrument with an alpha reliability coefficient of 0.82. After initial testing the authors created a twenty-eight item instrument with acceptable validity and reliability (Cronbach's alpha scores of .92 for the Turkish version and .91 for the version translated into English). This was the first attempt documented in the literature to develop and validate an instrument to measure self-efficacy with information literacy skills.

Another self-efficacy information literacy instrument was developed and tested by Monoi, O'Hanlon and Diaz in 2005, and the questions are correlated with outcomes enumerated by the ACRL Standards (ACRL, 2000). This direct correlation with established standards provides the instrument with practical significance as the library instruction efforts of many institutions are also aligned with these standards. A description of the instrument development and validation is included under the study design and data analysis heading in this section. The authors comment that their instrument is useful to measure changes in self-efficacy that may occur as a result of exposure to library instruction. The instrument is particularly useful to the embedded librarian project to evaluate pre- and post-implementation self-efficacy scores and

investigate possible correlations between self-efficacy prior to participation in the embedded librarian project.

As previously mentioned, two studies that investigated students' self-efficacy with information literacy did not utilize validated instruments. While the authors did not use validated instruments, the studies are of sufficient quality to be useful for researchers seeking to investigate similar topics. The first of those studies was conducted by Ren (2000) in which the author conducted a quasi-experimental study to determine if students' self-efficacy with library searches improved after being exposed to library instruction. Student participants in this study were asked to complete thirteen tasks and question their self-efficacy while performing the tasks. Search performance was self-assessed and externally assessed by librarians. Conclusions from this study included an increase in self-efficacy as a result of training, and students who exhibited relatively higher self-efficacy in the pre-test also exhibited relatively higher self-efficacy in the post-test. This study paved the way for future research including the Beile and Boote (2004) study.

Beile & Boote (2004) conducted a well-designed and well analyzed quasi-experimental study to compare self-efficacy scores and library skills performance for face-to-face and online instruction. The authors clearly describe their methodology and data analysis detailing the various statistical tests performed, which included a multivariate analysis of variance (MANOVA), multivariate analysis of co-variance (MANCOVA) (with pre-instruction self-efficacy levels, pre-instruction library skills scores, and exposure to prior library instruction as covariates) and paired t-tests. The analyses utilized were appropriate to the research questions and study design, and the

discussion of results confirmed the data. In addition to solid design and analyses, the authors clearly indicate study limitations, which include the use of a single, perhaps limited, performance measure (a library skills test) and a lack of validation with the study's population sample. Another unstated limitation is the use of un-validated instruments to measure self-efficacy and library skills performance. The Monoi, O'Hanlon & Diaz (2005) instrument was adapted and utilized to evaluate information literacy self-efficacy and library skill performance in the OnMed case, and this will be further discussed in the research design section.

Citation Analysis

Citation analysis is a form of bibliometrics that has been employed by librarians for years in a variety of contexts. Historically, it has been employed in a collection management capacity to evaluate library collections (Hirose & Nakazawa, 2007). More recently, citation analysis has been used to evaluate the differences between expert and novice searchers (Whipple, McGowan, Dixon & Zafar, 2009), the quality of written artifacts including journals (Bauerly & Johnson, 2005; Brazzeal & Fowler, 2005; Bruer, 1985; De Groote, 2008; Drori, 2003; Eckel, 2009; Edzan, 2008; Gao, Yu, & Luo, 2009; Herther, 2009; Jiao, Onwuegbuzie, & Waytowich, 2008; Olatokun, 2009; Sam & Tackie, 2007; Sherriff, 2010; Thomas, 2000; Tunon & Brydges, 2006 & 2009), and the effectiveness of library instruction (Brunvand & Pashkova-Balkenhol, 2008; Hurst & Leonard, 2007).

Citation analysis is a general term used to describe an analytic study of the number and type of citations in a given document. Neuhaus and Daniel (2008), Herther (2009) and Sun (2007) discuss the various uses of citation analysis in library and information science research. A number of bibliographic databases, including ISI's Web

of Science, Journal Citation Reports (another ISI product), and Elsevier's Scopus

provide times-cited information about specific journals and articles. Librarians and

researchers use these databases as one source of data in citation analysis. Other data

sources in citation analysis focus on written artifacts submitted by students, especially

at the graduate level. For the purposes of this study, the literature review will focus on

relevant studies describing the use of citation analysis to evaluate the quality of student

writing or the impact of library instruction.

Most of the articles reviewed analyzed written artifacts from traditional, on-campus

institutions and courses; however, Tunon & Brydges (2009) analyzed citations from the

reference lists of doctoral dissertations and made comparisons between traditional and

non-traditional (primarily distance education) institutions. The authors used a multi-

pronged approach to analyze the dissertations, including a traditional statistical analysis

(descriptive statistics of citation patterns), an objective rubric, and a subjective rubric.

Both rubrics were validated, a process which was discussed at length in Tunon &

Brydges (2005). The objective rubric assigned points for the quality of a citation based

on the type and age of references while the subjective rubric assessed various aspects

of the breadth and depth of references cited in doctoral dissertations. Tunon and

Brydges concluded that the quality of dissertations in traditional and non-traditional

institutions have more commonalities and few differences, with the exception in a single

aspect of citation quality. The breadth of the resources used was significantly higher for

the traditional group, demonstrating that the students enrolled in traditional doctoral

programs used a wider variety of resources. The use of the two rubrics is an interesting

and informative approach to gauge the quality of dissertations and can be used to evaluate the effectiveness of instruction.

Two key studies use citation analysis as an indicator of the quality of student written artifacts and evaluate the effectiveness of library instruction based on the quality of students' writing. In 2007, Hurst and Leonard compared the term papers of three groups of students, two who received library instruction and one who received no library instruction. The reference lists of the papers were analyzed for two main factors: the total number of unique citations and the variety of source types (peer reviewed journal articles, non-peer reviewed journal articles, books, proceedings, web sites, etc.). Basic descriptive statistics including tests of differences, such as means and proportions, were utilized to determine if the differences in number and types of citations was statistically significant. The authors found that there were statistically significant differences in the quantity of citations and the variety of resources cited between the students who were exposed to the library instruction and those who were not. This type of citation analysis was used to evaluate the written artifacts of students who participated in the voluntary embedded librarian project and provided empirical evidence for requiring intensive library/information literacy instruction.

Rather than using citation analysis to evaluate the effectiveness of library instruction, Pashkova-Balkenhol (2008) used citation analysis to determine the need for incorporating new topics (government documents research) into existing library instruction sessions. The analysis showed definitively that students primarily cited books and journals and made little use of government information. Data from the analysis was used to support the incorporation of new topics into the traditional information literacy

sessions. From the literature discussion above, it is clear that libraries are using citation analysis to evaluate research quality and instructional impact.

Case Study and Qualitative Inquiry

Case studies are commonly used in the social sciences, particularly educational settings including libraries and health care (Yin, 2009). In fact, the OnMed program itself is being evaluated using a case study approach (Clark, 2010), therefore a case study approach to evaluate the embedded librarian within an OnMed course fits well with the overall program evaluation. The use of case studies in library research is described by Powell (1997) in the third edition of his book *Basic Research Methods for Librarians*, which is frequently used in library and information science education to prepare librarians to conduct research. Powell describes case study research as a qualitative methodology and its uses in answering research questions relevant to practicing librarians (Powell, 1997). While others may argue with the description of case study research as a qualitative methodology (Yin, 2009), Powell's point about the use of case study research in librarianship is illustrated by the number of case studies published in the field (Clayton, 1995; Foote, 2001; Watson-Boone, 2000).

Regardless of whether or not case study research can be characterized as qualitative research, qualitative research methodologies are a natural fit within the research of librarianship (Davis 1990, p. 327). Ethnographic approaches are used in academic libraries to understand the culture of the users and help librarians improve services and/or instruction. A prime (and heavily cited) example is University of Rochester Library's use of an ethnographic approach to study the culture of their undergraduate students to rethink their services and library spaces (Foster & Gibbons, 2007).

The OnMed Embedded Librarian Case

Overview

The following sections will describe the details of the case, including the setting and participants, outline the embedded librarian content, and finally discuss the theories influencing the instructional design of the embedded librarian materials.

Setting

Distance and online learning at the University of Florida has exhibited tremendous growth and continues to expand as the initiatives were provided official administrative support from the university president: "To facilitate this change, we are seeking a distance education infrastructure company to help us increase the 52 programs we now offer online"(Machen, 2010). The university offers both graduate and undergraduate degrees through distance learning. Online learning in both the College of Education and the Health Science Center colleges is important to the context of the project because of the overlapping nature of the OnMed Program.

Distance learning programs within the College of Education include topic areas such as Educational Leadership, Educational Administration & Policy, Higher Education, and Educational Technology. Distance education courses vary in format and delivery mechanisms and include online courses, remote site courses, and blended courses. Online courses are asynchronous and deliver content via network technology utlizing Moodle as a course management system. The College of Education is the only college on campus that uses Moodle; the rest of campus used WebCT until recently when Sakai was adopted. Using a non-campus supported course management system necessitated that the product be supported within the college. The College of Education has a dedicated Distance Learning office to support Moodle and online learning. The

use of different course management systems is significant to this project because the OnMed participants take courses in Moodle; however, they use Sakai to facilitate their online teaching.

The Health Science Center (HSC) is comprised of six colleges: Dentistry, Medicine, Nursing, Pharmacy, Public Health & Health Professions, and Veterinary Medicine. Faculty in those colleges can have multiple roles as teachers, researchers, and practitioners/clinicians. Faculty development typically occurs at the college level; however, recently an interest group was convened to discuss collaborating on faculty development efforts across the HSC. Improving teaching practices is one of the areas included in the faculty development curricula. The College of Medicine has created a certificate program to focus on clinical teaching and pedagogy of the attending physicians referred to as the Master Educator Fellowship (MEF) program. All of the OnMed cohort members completed the fellowship previously and have similar prior knowledge about pedagogy and clinical education.

There is a growing amount of distance and online learning occurring in the HSC. Distance education efforts in the HSC include fully distance degrees (through remote sites and online) and online courses for campus based students. In keeping with the rest of the university (except for the College of Education), the HSC colleges use Sakai as the course management system. Faculty teaching in all of the six HSC colleges need familiarity with concepts and practices in educational technology, specifically as it relates to teaching and learning online. The OnMed program was designed to fill the niche of providing HSC faculty with the background and skills needed to employ educational technology to enhance clinical teaching. Faculty, staff, and students in the

HSC have access to a comprehensive specialized library known as the Health Science Center Library.

The Health Science Center Library (HSC Library) is housed within the Health Science Center in direct proximity to the colleges it serves. While it is physically housed in the HSC, administratively, the HSC Library is a part of the larger campus library system known as the Smathers Libraries. The library is well known for its established liaison program (Tennant, Butson, Rezeau, Tucker, Boyle & Clayton, 2001; Tennant, Cataldo, Sherwill-Navarro & Jesano, 2006; Feree, Schaefer, Butson & Tennant, 2009) wherein a librarian liaises to a particular college or department facilitating the establishment of expertise with the subject area and the development of strong working relationships with the users. The HSC Library currently provides face-to-face course integrated instruction as well as stand-alone instruction on various topics including database searching and citation management software. Liaison librarians are integrated into their distance and online programs to a varying extent, but to date there have been no opportunities for a truly embedded librarian program.

Participants

Participants in this study are practicing health care professionals enrolled in the inaugural cohort of the OnMed program. While OnMed participants are part time graduate students in the College of Education, they are full time faculty in the Health Science Center, primarily in the Colleges of Dentistry, Medicine and Pharmacy. The first cohort is comprised of six students representing the Colleges of Dentistry, Medicine, and Pharmacy. Four of the students are College of Medicine faculty and attending physicians at the UF & Shands HealthCare system, representing various departments including Anesthesia and Pediatrics.

The Embedded Librarian Project

Course integrated and contextualized instruction occurred in the course EDG 6931 Issues in Educational Technology Research. The course is specific to the OnMed program and, as such, is comprised solely of practicing health professionals. Rather than focusing on specific methodologies, the course is designed to provide an introduction to and overview of research in educational technology. Students were required to develop a research question, search the literature, critically evaluate research articles and synthesize the research. The final course deliverable is a brief (ten-item) annotated bibliography focusing on a research question of interest. Of the courses offered during the spring 2010 semester, it is the best fit for the librarian researcher's knowledge and experiences.

Building upon the literature and prior experience with online embedded librarianship for graduate educational technology, the instructional intervention was designed to include primarily asynchronous components, with occasional synchronous options as necessary to provide optimal support for the students. The EME 5054 Foundations of Educational Technology embedded librarian project described in Edwards, Kumar and Ochoa (2010) serves as the pilot for the OnMed project and informed not only the implementation of the embedded librarian project but also the case study evaluation and description of the implementation of that project as well. Findings from the pilot support the creation of customized library instructional material and the integrated availability of a librarian, both synchronously and asynchronously.

Specific experiences from the pilot informed the OnMed design. For example, the pilot project included weekly optional synchronous office hours, which none of the participants used, and the office hours were discontinued in the OnMed implementation.

Instead of using set office hours, the OnMed project used a "drop-in" style synchronous option in the form of a Meebo instant message chat utility students could use to contact the librarian. One of the recommendations for future research from the pilot concentrated on the quantitative assessment of the embedded librarian and suggested that future pre- and post-assessments be paired for improved data analysis, a recommendation that was implemented in the OnMed embedded librarian case.

Using conclusions and lessons learned from the pilot, the librarian researcher designed and implemented an embedded librarian instance based upon the Morrison, Ross, and Kemp (MRK) instructional design model (Morrison, Ross, & Kemp, 2006). Consistent with the Morrison, Ross, and Kemp (2007) instructional design model, the exact configuration of the instructional components that comprise the embedded librarian experience was influenced by the needs analysis, including analysis of the learners, context of the study, and tasks required of the students. The needs analysis was based in part upon a survey administered by the OnMed program coordinators. It was determined from the survey that participants had a range of technology skills, but the majority of respondents were open to learning and using technology (OnMed Evaluation Materials Participant Survey, 2010).

Additional information about needs of the learners was gleaned through close collaboration with the course instructor, as faculty collaboration is a key component of embedded librarianship (Bozeman & Owens, 2008; Dewey, 2004; Dugan, 2008; Hall, 2008; Kesselman & Watstein, 2009; Lillard et al., 2009; Love & Norwood, 2007; Matthew & Schroeder, 2006; Moore, 2004; Ramsay & Kinne, 2006; Kearley & Phillips, 2004). From consultations with the instructor, it was determined that library support

should not only include procedural task-oriented support (a demonstration of the MeSH browser tool for example), but it should also include higher-level cognitive tasks to reinforce instructor-developed content (for example critical evaluation of research). For the OnMed students the instructional goals focused on increasing students' library and information literacy skills in the areas of health science education and educational technology. The library instruction included foundational "core" concepts relevant to educational technology and other concepts specific to the needs of the course.

Based upon the OnMed survey data and discussion with the course instructor, the embedded librarian content was developed to provide general course support and to support the course modules for six of the eight weeks. General resources included an OnMed LibGuide, a VPN installation demonstration video, and an optional asynchronous library help discussion forum. See Table 3-1 for details on the course modules and corresponding library content.

While the course instructor and librarian decided that most of the library content should be asynchronous to allow for maximum flexibility for the participants (especially due to their demanding clinical responsibilities), initially a synchronous session was scheduled to provide training on the use of RefWorks, a library-supported bibliographic management system. The College of Education uses and supports Elluminate (now referred to as BlackBoard Connect) for synchronous audiographic communication. The librarian researcher was an experienced Elluminate user; therefore, Elluminate was the chosen platform for the synchronous session. An additional benefit of Elluminate is that sessions can be recorded for later viewing, thus increasing the flexibility for users who either could not attend the synchronous session or wished to review the content. Due to

scheduling issues, the synchronous RefWorks session was rescheduled and then it was converted to an asynchronous mode using the recording feature in Elluminate.

Case study data was collected by the librarian researcher who acted as a participant observer in the course by interacting with the students and instructor in order to establish familiarity with the course content, participants, and participant research interests. As mentioned previously, the embedded librarian concept exemplified in this project extends beyond the creation of predetermined instructional materials to interactive participation in relevant discussions and the creation of adaptive content to suit not only the structured course content but also an unstructured organically developed content as well.

Theories Influencing the Embedded Librarian Content Design

Duties of academic librarians are gradually shifting to include "blended librarians" who incorporate educational technology/instructional design skills and knowledge with the traditionally held librarian roles (Bell & Shank, 2004; 2006). The literature reflects the efficacy of using an instructional design approach in general, and more research is needed to explore the effect of various instructional design models on library instruction. The instructional intervention described in this project was developed using the Morrison, Ross, and Kemp (MRK) (2006) iterative design model.

Message design is a component of the MRK instructional design model and is increasingly significant as multimedia is used often to support online instruction. Paivio's (1986) dual coding theory and Mayer's research (Mayer, 1997; Mayer & Moreno, 1998 & 2005) in the area of multimedia and cognition influence the design of learning objects developed to support the online library instruction in this project. Through his research with cognition, Paivio identifies three types of processing (representational, referential,

56

and associative) and suggests that recall is improved by presenting information in verbal and visual formats. According to dual coding theory (DCT), cognition involves verbal and non-verbal subsystems, and instruction that requires both subsystems will maximize cognition and recall (Paivio, 1991). Dual coding theory and Paivio's three types of processing directly inform research on the cognition of multimedia learning. Representational processing refers to the direct activation of either the verbal or non-verbal subsystems; referential processing describes the activation of one of the subsystems by the other (the nonverbal system activates the verbal or vice versa); and associative processing refers to the same system (verbal or nonverbal) being activated by a representation (Paivio 1986). Researchers have continued to test Paivo's DCT with a variety of research studies, and his work is used to inform other theoretical work including the cognitive theory of multimedia learning.

Cognitive theories of multimedia learning influence the design of online learning objects. Mayer is a leading researcher in this area. Mayer and Moreno (1998) use Clark and Paivo's (1991) work to inform their research and make conclusions regarding multimedia learning. In a 1998 article Mayer and Moreno discuss the results of their research regarding a split attention effect in multimedia learning and use it to support dual processing theory. The referential processing component of Paivio's DCT is a key element in Mayer's dual processing theory of multimedia learning as it supports the conclusion that connections between visual and auditory channels can only occur when both images and verbal information are stored in working memory simultaneously (Mayer & Moreno, 1998).

While Mayer's work with multimedia learning has clear implications for instructional design, a 2005 paper (Mayer & Moreno) directly outlines five principles for multimedia design to guide instructional design of multimedia learning objects and direct further research. Mayer's five principles can be summarized as follows.

- Multiple Representation – It is better to explain a concept using more than one mode.

- Contiguity Principle – When presenting information verbally and visually, the words and images should be presented simultaneously rather than separately.

- Split-Attention Principle - Words should be presented through narration rather than visually (through text) to reduce the cognitive load on the visual processing channel and split the load between the verbal and visual channels.

- Individual Differences Principle – The multimedia effects on cognition vary according to differences in the individual learners.

- Coherence Principle – Shorter summaries of information (with fewer words and important words and images highlighted) result in more learning than longer, more detailed descriptions.

These principles are research based and grounded in learning theories, and as such they provide concrete guidelines for designing effective learning objects.

Because this project involves online library instruction, it is important to ground the research in core distance education theories, primarily Moore's theory of transactional distance and interactions in distance education. Regarding transactional distance, this project focuses on minimizing the transactional distance between distance learning students and library content by providing appropriately designed learning situations. The aim of library instruction is to increase interactions, especially learner-content interactions by facilitating access to and critical evaluation of relevant literature and other resources.

Research Design and Data Analysis

Overview

As previously stated, the purpose of this project was to develop and evaluate an embedded librarian program. The primary research question is - How does the presence of an online embedded librarian influence graduate students' experience in an online educational technology research class as defined by these specific aspects:

- Self-efficacy with information literacy and library skills as measured by changes in performance on a pre- and post-assessment

- Library skill performance as measured by changes in performance on a pre- and post-assessment

- Quality of graduate students' research as measured by the quality of citations in an annotated bibliography

- Reflections on the embedded librarian experience and processes of searching and critically evaluating the literature

The online-embedded instruction was assessed using a mixed-methods, multi-pronged evaluation strategy in a case study research design. As noted by Yin, case study methodology allows the researcher to explore social phenomena and answer questions concerning how and why a particular program works (or doesn't work) (2009). While traditionally case studies focus on qualitative methods (Patton, 2001; Yin, 2009), the research questions and nature of this project necessitate quantitative data as well as qualitative data. The research questions seek to describe if and how an embedded librarian influences the OnMed Issues in Education Research course; therefore, the purpose of the research falls into the category of an exploratory case study. The selection of the unit of analysis (or case) for this project was based upon the researcher's prior experiences with the course content, the medical education information sources, and the health care practitioners who comprise the study

population. Additional factors influencing case selection focused on the unique context of the OnMed program and the participants' dual status as health care professionals and online graduate students.

Quantitative assessment strategies included a pre/post survey designed to gauge students' perceived self-efficacy with using library resources and performance on select library related tasks. Additional quantitative assessments focused on an analysis of the students' citations as a measure of quality of the research and indirect evidence of learning. Performance on the pre/post tests and citation analysis results were compared by pairing the data for each respondent and performing paired t-tests. T-tests were conducted on an individual's performance on both the overall assessment and individual items. Statistical analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 19.

Assessing Self-Efficacy and Library Skill Performance

In order to measure students' self-efficacy with library resource and information literacy concepts, a twelve-item instrument designed by Monoi, O'Hanlon & Diaz (2005), was adapted with permission. The instrument was aligned to learning outcomes described by the ACRL Information Literacy Standards and has been thoroughly validated (Appendix A). A full description of the design and development of the instrument is included under the methodology review heading. In addition to the self-efficacy scale, the pre/post-tests included four items designed to measure students' performance on library related tasks.

The information literacy/library skills assessments were administered through an online survey (Zoomerang®) during the first and last weeks of the course (weeks 1 and 8). Responses were paired by the course instructor and de-identified prior to sending to

the embedded librarian. Descriptive and inferential statistical analysis methods allowed for a thorough understanding of the data and investigation of a change in performance after the embedded librarian program is complete. Unpaired data was disregarded, and paired t-tests were conducted on the remaining data to measure individual change before and after the intervention.

Citation Analysis

As previously stated, citation analysis (a form of bibliometrics) is traditionally a strength of library and information science research. Students' written artifacts (in the form of an annotated bibliography) were evaluated by the librarian researcher with rubrics (used with permission from a similar study by Tunon & Brydges 2006) to make comparisons between participants and non-participants. The two rubrics used in the citation analysis procedure provide both objective and subjective assessment of the references without evaluating how the citations were used within the body of the assignment. The methodology review section includes more detail regarding the design and evaluation of the Tunon and Brydges (2006) rubrics.

Although reliability data for the rubrics is available from the Tunon and Brydges studies, because the context and researchers differ from the original study, it was important to establish reliability specific to the context of the OnMed course. An Inter-rater reliability value was measured by having two librarians use the rubrics to evaluate the annotated bibliographies and computing Pearson's p for correlation coefficient. The calculations resulted in a Pearson's value of 0.713, which indicates moderate correlation and sufficient inter-rater reliability to proceed with using the rubrics to evaluate the annotated bibliography assignments.

In the embedded librarian evaluation project, citation analysis (used as a measure of quality of student learning) included general descriptive analysis of the citations in the annotated bibliography assignment that focused on citation patterns, such as the mean age and frequency of references. The objective rubric assessed a point value to each reference (according to criteria such as age, type of reference, etc.), and a total score for each reference list was calculated (Appendix B). The subjective rubric measured the quality of reference lists through expert review of the references on criteria including breadth, depth, and appropriateness for the topic (Appendix C). See Figures 3-1 and 3-2 for a graphical overview of how the two rubrics were used.

Citations were processed and analyzed using a procedure similar to the one employed by Tunon and Brydges (2006), with some modifications allowing for the shift from dissertation reference list (used by Tunon & Brydges) to annotated bibliography assignment and the overall purpose of the analysis. Specifically, the purpose of the Tunon & Byrdges (2006) analysis was comparative, while the purpose of this analysis is strictly descriptive.

The citations were gathered from anonymous participant generated annotated bibliographies. Each citation was assigned a unique alpha numeric identifier that included a single letter to identify the annotated bibliography document (A-F for six individual bibliographies) and a number referencing the order the citation appeared in the bibliography. For example, the first citation in participant one's bibliography was identified as A1 and the last citation for participant six's bibliography was F10. Once the citations were removed from the word document bibliographies, they were entered into an excel spreadsheet listing all citations. Categories matching the categories in the

62

objective rubric for document type were created, and each citation was categorized. In cases where a document meets several categories, they were assigned to the category for the function rather than form of the document. For example, an online government report was counted as a report rather than a web page. See the results section for a breakdown of the citation categories and number of citations in each category.

Once the citations were categorized, each citation was scored according to both rubrics. In addition to scoring each citation separately, a compiled score was generated for each annotated bibliography by computing the mean scores of the citations included in the bibliography. Only citations with an annotation were analyzed to focus on the intent of the annotated bibliography assignment, which was to locate, select, and critique research articles to help answer the participants' research questions. This was generally not an issue as most annotated bibliography assignments included only those citations being annotated. However, in one of the bibliographies, a participant included additional references for each annotation; in this case only the citation being annotated was included in the analysis. SPSS version 19 was used to provide descriptive statistics on the citations and bibliographies, and the results are reported in chapter four.

Qualitative Data Analysis

Qualitative data sources focus on narrative reflections in the form of participant narrative responses to questions designed to elicit reflective feedback. The qualitative data was analyzed with a grounded theory approach (Glaser & Strauss, 1967) to explore themes and develop core variables to describe students' experiences with the embedded librarian, which includes instructional content and the prolonged presence of a librarian within the course. Analysis was facilitated by the use of the software, NVivo9®. NVivo was useful for creating first level codes and querying the coded data to

facilitate the development of patterns and themes. Participants were asked to respond in writing to the following questions:

- What role did the librarian (who offered instructional support and assistance) play in your process of completing the annotated bibliography assignment (describing research questions, refining your question, searching for literature, and finally evaluating and synthesizing the literature)?

- In what ways/How did your prior experiences in clinical research and literature searching influence your completion of the annotated bibliography assignment and use of the embedded librarian support?

Reflections were submitted to the course instructor in writing, de-identified, and forwarded to the researcher for analysis. One of the benefits of having the participants respond in writing is that the data did not require transcription and subsequent member checking to determine accurate representation.

The reflection questions were developed at the course's midpoint (week 4), which allowed the researcher to not only query the participants to gain insight into the embedded librarian experience (thus helping to answer the research questions), but also tailor the questions according to the state of the embedded librarian project. For example, the researcher noted the high quality of the participants' discussions and lack of interaction with the librarian researcher. Those observations caused the librarian researcher to hypothesize that the cause was possibly rooted in their years of experience as health care practitioners who are theoretically familiar with searching and evaluating the medical literature. As a result of those observations, one of the reflective questions was developed to explore the lack of interaction, perceived high quality responses and to question the working hypothesis.

Additional perspectives

While most of the data collection strategies focused on describing the learners'

experiences with the embedded librarian, it was important to consider the course

instructor's perspective to provide a holistic description of the embedded librarian

project. A post implementation, semi-structured interview was conducted to provide

qualitative feedback. The interview was conducted face-to-face, recorded electronically,

and transcribed. To follow quality qualitative research protocol, the interview transcript

was sent to the course instructor for member checking. The transcript was coded using

an open approach and analyzed thematically. See Appendix D for the interview

instrument. Informal field notes were used in order to document the experiences of the

librarian researcher. Notes were organized by week and recorded in a web-based

document tool, Google Docs.

All data, quantitative and qualitative, were analyzed and triangulated to evaluate

the success of the embedded librarian program and describe the experience. Analysis

(including development of first and second level codes and thematic analysis) of the

participant reflections was discussed and verified with an external qualitative researcher

to increase validity. Data from the course instructor and field notes from the librarian

researcher served as triangulation points and were used to compare to the primary data

from the participants in order to provide additional perspectives.

Validity

In an effort to provide an accurate evaluation and description of the embedded

librarian program and holistic description of the experience, it is important to establish

validity. As Yin (2009) notes, the four factors describing the validity of social science

research design apply to case study research as a subset of social science research.

According to Seliger and Shohamy (1989), internal validity is controlled by research design and data collection: "Findings can be said to be internally invalid because they may have been affected by factors other than those thought to have caused them, or because the interpretation of the data by the researcher is not clearly supportable" (p. 95). In the evaluation of the online embedded librarian case study internal validity is affected by the design and instruments used (including the pre/post self-efficacy measure and citation analysis rubrics). All data collection instruments were borrowed (with permission) from researchers who created and validated them in an attempt to ensure valid results. The self-efficacy instrument was modified by the removal of one item and addition of two items (a multi-part item to measure library skill performance [item #12 parts a-c] and an item to measure confidence in completing the performance item [item #13]). The citation analysis rubrics were used without modification. Content validity on both instruments was further established by expert evaluation by experienced health science librarians. Internal validity in case study research can be addressed in the research design and data analysis phases by using pattern matching, explanation building, addressing rival explanations, and using logic models (Yin, 2009).

External validity refers to the extent to which the study findings can be generalized to another context or a larger group: "Findings can be said to be externally invalid because [they] cannot be extended or applied to contexts outside those in which the research took place" (Seliger & Shohamy, 1989, p. 95). One of the criticisms of case study research is its perceived low level of external validity (Yin, 2009). Yin differentiates between statistical generalizations (common in survey research) and

66

analytic generalizations use to generalize case study findings to theory (Yin, 2009).

Despite these threats to external validity, it is possible to influence the validity and

accuracy of the case study by member checking qualitative data and compiling an audit

trail for data and documents collected during the study (Yin, 2009). To that end, all of

the data collection instruments, transcripts, and reflective data are included in the audit

trail.

Table 3-1. Embedded library content

Week	Course Module	Embedded Library Content
1	Introduction	1) Introduction Forum
		2) 2) Pre-Assessment
2	Reading Research	1) RefWorks Elluminate Session
		2) RefWorks Handout
		3) What is an annotated bibliography
		4) Critical Analysis LibGuide
3	Research Questions	N/A
4	Mid-Point	1) Peer Review & Ulrich's
		2) Searching Ulrich's
		3) Journal Citation Reports Video
5	Building Your Annotated Bibliography	1) ERIC demonstration video
		2) MeSH demonstration video
		3) Why Use MeSH video

Table 3-1 Continued

Week	Course Module	Embedded Library Content
6	Working on your Annotated Bibliography	Search Support (including presentation on finding medical education literature and general database search techniques)
7	Annotated Bibliography	Continued search support
8	Issues and Current Research	N/A
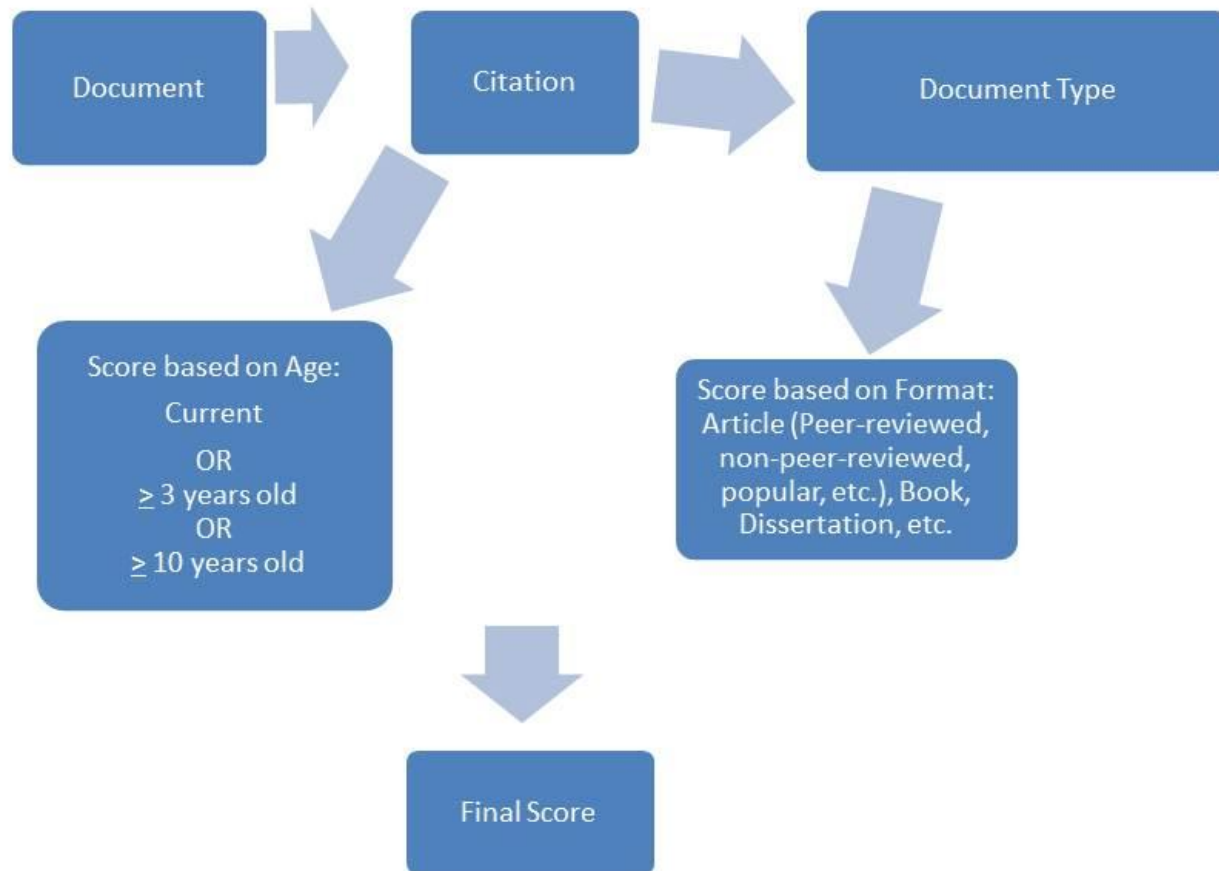
Objective Rubric

The purpose of the objective rubric is to evaluate **each citation** in the reference list individually according to specific criteria and then sum the scores to achieve a total score for the document.

Figure 3-1. Objective Rubric

Document

Criteria 1: Breadth
Number and variety of resources

Criteria 2: Depth
Citing historical/seminal, theoretical & background resources

Criteria 3: Currency
Collective age of the resources cited

Criteria 4: Relevance to topic
Relevance of the resources cited to the topic of the document

FINAL SCORE
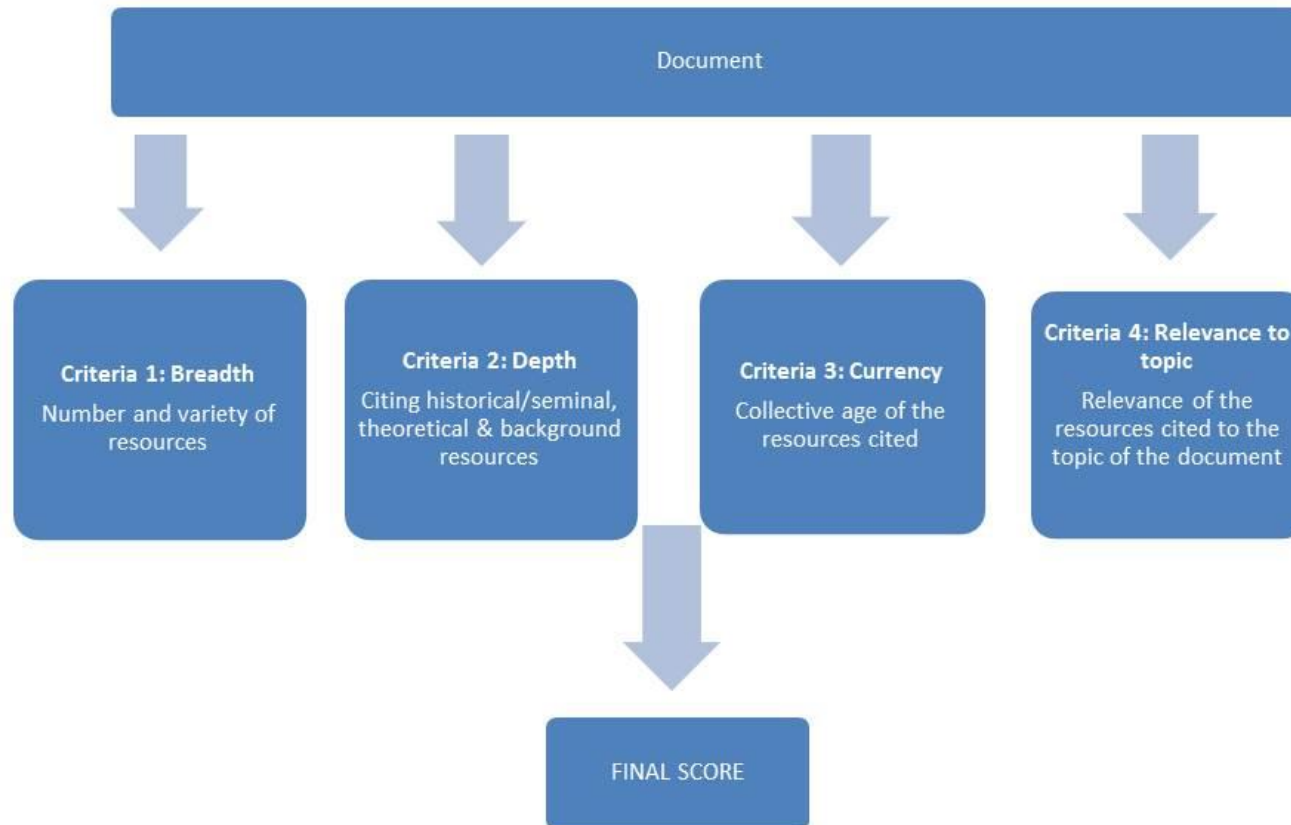
Subjective Rubric Evaluation

The purpose of the subjective rubric is to evaluate the document as a whole including the topic, purpose, and research questions in relation to the citations listed in the reference list. Each criteria could had four levels from level 1 (inadequate) to level 4 (superior)

Figure 3-2. Subjective Rubric

CHAPTER 4
RESULTS

Introductory Remarks

As academic librarians have continued to integrate themselves into curricular activities, the concept of the embedded librarian has evolved, and implementation of embedded librarian projects are being described in the professional literature (Cipkin, 2002; Jobe & Deborah, 2000; Markgraf, 2004; Moore, 2004; Ramsay & Kinne, 2006; Kearley & Phillips, 2004; Shumaker & Talley, 2009). Currently, assessment of these embedded librarians is limited to reactive feedback from students, with some data describing the experience from the perspective of the course instructor (Bozeman & Owens 2008; Edwards, Kumar & Ochoa 2010; Dewey 2004; Dugan 2008; Freiburger & Kramer 2009; Hall 2008; Lillard et al. 2009; Kesselman & Watstein 2009; Matthew & Schroder 2006; Rudin 2008; York & Vance 2009). To that end, the librarian researcher developed a study of a context-specific embedded librarian implementation with the purpose of describing the experience and measuring impact. The results chapter describes the data collected from a mixed methods case study that investigates how the presence of an embedded librarian influences an online graduate course. Participants are full-time health care practitioners and academic health care faculty in the areas of medicine, pharmacy, and dentistry enrolled in the OnMed program. OnMed is a Master's Degree program developed to provide clinical educators with a background in educational technology.

Data was collected for eight weeks from the sixth of March through the twenty-second of April in 2011. Complete data (including pre- and post-test scores, citation metrics, and reflections) were available from four of the six OnMed students enrolled in

the course. Citation metrics and reflective data were available from all six students. A variety of data was collected on each participant, providing sufficient data with which to describe the experience and develop a working theory for how the librarian influenced participants to answer the primary research question - How does the presence of an online embedded librarian influence graduate students' experiences in an online educational technology research class as defined by their self-efficacy with information literacy, research quality, and descriptive narrative reflections?

This chapter reports the results beginning with the quantitative data (resource access, pre- and post-tests and citation analysis) then moves on to the more descriptive qualitative data (narrative reflections and instructor interview). Informal observations from the librarian researcher were used to help triangulate the data to provide validity and reliability.

Quantitative Data

Student Access of Instructional Materials

Six students were enrolled in the eight-week course, some of whom availed themselves of the embedded library resources and provided feedback. While direct interaction with the students was limited (one question was received, and it came during the last week of the course), analysis of the Moodle access log data shows that the instructional elements were viewed, in many cases multiple times by the same individuals. Table 4-1 displays the access information for the library content. The most heavily viewed resources included the ERIC demonstration (11 views), the peer review and Ulrich's resource (9 views), the MeSH demonstration (7 views), and the OnMed Libguide (7 views).

Pre-Post-Assessment Data

Information literacy self-efficacy

Participants completed voluntary pre- and post-implementation assessments designed to measure self-efficacy with information literacy and library skills (Likert items) as well as performance on three library/research oriented tasks (open-ended items). The pre-and post-implementation assessment data was collected via an online survey application (Zoomerang) and analyzed first to check if the data meet the assumptions for conducting paired t-tests (independent observations, dependent variable measured on an interval scale, normal distribution) by construction of a histogram, nearest quartile (NQ plot), and box plot. After confirming that a paired t-test was appropriate for the data, each of the Likert-scale assessment questions was evaluated.

The descriptive statistics for the pre-test scores shown in Table 4-2 indicate that the most frequently occurring confidence value is 2.0, demonstrating that for all 14 Likert-scale questions, respondents fell between not confident and neutral, with a high level of variance in scores (.850). Post-test scores demonstrated a much lower amount of variance (.216) and a mode falling between confident and very confident.

Paired t-test

The null hypothesis for the paired t-test was that the pre-test and post-test means were equivalent, and the alternate hypothesis showed the pre- and post-test means were not equal. Results indicate that there was a significant difference in the scores for the pre-tests (M=3.06, SD=.92) and post-test scores ((M=4.23, SD=.46); (t(13)=-7.17, p = .000)). Due to the p value, the null hypothesis is rejected, meaning the pre-test means

did not equal the post-test means. Statistically significant results indicate an increase in information literacy self-efficacy as measured by the assessment.

In addition to performing statistical analysis for the mean scores of all participants for each Likert item, a mean score (for all the Likert items) was calculated for each participant. The descriptive statistics for pre- and post-tests for each participant are illustrated in Table 4-3, while Table 4-2 illustrates the paired t-test data. Data indicates that in all cases, there was a positive increase between the pre and post-test and the exact change in mean scores ranges from .714 to 2.65. Table 4-3 illustrates all delta mean values.

Library skill performance

In addition to assessing self-efficacy, the assessment also contained items requiring participants to utilize library resources to complete various tasks. Participants were asked to locate electronic access to a specific journal title and specify the dates available, use a database of their choosing to find an article on blended learning in undergraduate medical education, and use the library catalog to find a book in electronic format. The performance results for the first question regarding electronic access to a journal indicate that there was a 33.4% increase in correct responses between the pre and post assessments.

Pre-test results from this question "Using the library catalog find an electronic book on the topic of blended learning" - demonstrated reliance on general sources including Google Scholar with no mention of the use of subject headings. In the post-test, all respondents indicated that they used a library database, and two mentioned the use of subject headings (MeSH), demonstrating improved search performance. The final performance item required participants to use the library catalog to find an ebook on a

specific topic (blended learning), and all participants were able to complete this task satisfactorily in both the pre-and post-implementation assessments.

Citation Analysis

Citations used in participant-generated annotated bibliographies were analyzed as an indirect measure of research quality. The citation analysis used two validated rubrics to assign a numerical value to citations based on specified criteria. Objective scores were calculated based upon the type of resource (peer reviewed journals, books, dissertations, etc.) and the age of the citation (less than five years old, more than five years old, but less than or equal to ten years old). Each citation within a document was scored, and the scores were averaged to achieve a total score for the document. Subjective scores were calculated (by evaluating the document as a whole rather than evaluating each citation individually), based upon several factors including the type of source, age of source, depth of the sources listed, and relevancy to the topic.

Analysis of the citations from the annotated bibliography indicated that students used high quality sources. Both objective and subjective scores for all bibliographies were relatively high. Objective scores ranged from 2.75 to 2.9 (3.0 was the maximum score) and subjective scores ranged from 17 to 20 (out of a total of 20 points available). See Tables 4-4 and 4-5 for a summary of citation scores and a breakdown of the descriptive statistics. Almost all citations used in the annotated bibliography assignment were from peer-reviewed publications, and the primary variance in the citation categories was in the currency of the articles. When the bibliographies were analyzed with the subjective rubric criteria, the primary areas of variance included the currency of articles and the relevancy to the research question.

Qualitative Data

Participant Reflections

All six participants completed reflections, and the reflective data was analyzed for themes to develop a theory of how the presence of a librarian influenced participants. To increase validity, an external researcher verified that the data analysis procedure was appropriate and voiced no dissent with either the first and second level codes or themes that emerged from the data. However, recommendations were made to the librarian researcher to extend the text of some of the comments reflected in Table 4.6, when feasible, to provide additional context.

Themes

A variety of themes emerged from the data including both major themes and minor themes. There were four major themes identified:

1   The nature of the annotated bibliography assignment and critical analysis required in the annotations

2   Use of the library instructional materials

3   The literature search process in general and specifically the search terms and strategies used within the process

4   The process of finding useful and relevant articles

The last two themes are both related to literature searching in general and are separate components of the process. Each of these major themes are discussed in more detail below. See Table 4-6 for an illustration of the core themes with corresponding examples from the data.

Annotated bibliographies and critical analysis

A number of the responses discussed the nature of the annotated bibliography assignment and strategies used to approach the assignment. While the concept of an

annotated bibliography was foreign to many of the participants, the intent of analysis and synthesis of the research was familiar, and participants compared the process to familiar tasks such as writing a literature review for an article manuscript. In addition to strategies regarding the annotated bibliography assignment, participants commented on the critical analysis aspect of the assignment stating how the analysis of articles influenced their decisions and research.

Library instructional materials

One of the prevalent themes in the reflections was the customized library instructional content. Librarian-created instructional videos were mentioned in all participants' reflections with generally positive remarks. A minor theme associated with the instructional content was the reduction of search anxiety as a result of viewing the materials. One comment in particular highlighted a reduction in search anxiety after viewing the library instructional content: "Overall, I definitely experienced much less anxiety about the literature search with a good research question in hand and with a few of the tips I picked up from the instructional tutorial on annotated bibliographies" (OnMed reflections, lines 122-126). Similar comments regarding the instructional videos are displayed in Table 4-6.

Search terms and strategies

A significant theme within the reflections concerns the use of search terms and construction of search strategies. While some participants voiced experience and confidence with their literature searching ability (literature searching in general, not necessarily the use of search terms to construct search strategies), others expressed a lack of confidence and anxiety about the search process. To further complicate matters, some participants expressed both sentiments in the same reflection. One particularly

78

enlightening comment related that while the participant was comfortable with searching for clinical literature, searching for educational literature was different and introduced a certain level of anxiety: "The experience as a clinician and literature searching tricks were helpful, however, when you branch into a new field of vocabulary and research I felt lost especially when it feels abstract in addition to new territory of design and methods" (OnMed reflections, lines 161-164). Additional examples of comments supporting the search term and strategy theme are illustrated in Table 4-6.

Finding useful and relevant articles

The final major theme uncovered is related to the literature search process in general and is also a component of critical analysis. One of the final steps in the literature search is the ability to not only find results, but to find results that are both useful and related to the topic in question. Several participants commented on this topic, and the relevance of citations to the research topic was one of the subjective criteria in the citation analysis. See Table 4-6 for examples of comments supporting this theme. One particularly interesting comment describes the difficulty of finding relevant articles as a function of the massive increase in scholarly publications in recent years: "literature on it [my research topic] has literally exploded so it is hard to sort through what is relevant and what is not" (OnMed reflections, lines 49-50).

Minor themes

In addition to the major themes uncovered in the analysis of the participant reflections, a few significant minor themes emerged focusing on participants previous interactions with library resources and library instruction. These minor themes are discussed below.

Prior library experience

A minor theme that emerged from the reflective data regarded prior library experience. Participants commented on prior experience including prior literature searching experience, past experiences using a library, a lack of prior library experience, and also discussed prior library instruction and/or contact with a librarian.

Comments about prior experience with literature searching fell into two opposing broad categories – a lack of confidence in literature searching abilities and confidence with literature searching. Statements regarding a lack of confidence in searching are reported within the search strategies and terms theme. An example of a comment regarding search anxiety is: "when you branch into a new field of vocabulary and research I felt lost…" (OnMed reflections, line 161). This participant expressed feelings of search anxiety and lack of confidence particularly regarding searching in an unfamiliar area or discipline.

Illustrative examples of comments regarding positive experiences (or confidence in capabilities) with literature searching included statements such as: "I was familiar with PubMed and was pretty facile at finding the literature," (OnMed reflections, lines 32-22) and "I am familiar with searches using PubMed, Google scholar, GALE etc and organizing references with Endnote and reference manager…I did not use the librarian support for this" (OnMed reflections, lines 64-67). The connections between this self-expressed confidence with searching and results of the self-efficacy and library performance assessments are discussed in the triangulation section in chapter five.

Prior library instruction

Prior library instruction and interaction with a librarian was a sub-theme represented within the theme of prior library experience. One example of a participant's

prior interactions with a librarian caused confusion about the types of services provided

and the ways in which to best utilize a librarian:

> In general I don't know how to utilize librarians. A HSC librarian presents to the pediatric residents each year in order to prepare them to lead Journal Club. A statement was made that has stuck with me where the librarian explained that we should do our own searches and only when we're experiencing difficulty should we call the librarian for help. I don't attempt to involve a librarian in the early stages of the search…but I muddle through (OnMed reflections, lines 74-92).

This comment has particularly relevant implications for library services and the library

liaison program

Instructor Reflections

While the focus of the case study was on how the participants view the embedded

library experience, a defining feature of a course-level embedded librarian project was

close collaboration with course instructor. In order to explore the instructor's

perspective, a post-course interview was conducted. Themes from the instructor

interview include the quality of participant annotated bibliography submissions, an

emphasis on library instructional materials, limited interaction between the students and

librarian, and finally the literature search capabilities of the participants.

Quality of participant annotated bibliography assignments

In discussion of the quality of student assignments, the instructor commented: "I

was pleasantly surprised with the majority of the products that were produced"

(instructor interview, lines 22-23), and "I felt that if I was to compare the product, the

annotated bibliography products I think that they were more on par with what I would

see from a first year doc student rather than what I see from masters students"

(instructor interview, lines 23-25).

Library instructional materials

Comments regarding the instructional materials describe the quality of the learning objects: "I think the materials that you developed were not just instructionally sound from a librarianship perspective, but also from an instructional design perspective" (instructor interview, lines 14-16). When the interviewer/librarian researcher noted that the log data indicated usage of the instructional materials, the instructor supported that observation: "Students did use the resources" (instructor interview, line 353).

Limited interaction between students and librarian

Another theme to emerge from the post course interview concerned interactions between the embedded librarian researcher and the course participants. Specific comments that support this theme include: "I was assuming that many of the students also had issues of interface [with librarians] and that students were not interfacing and that at a minimum they would begin to establish relationships [with the librarian] on their own" (instructor interview, lines 19-21) and "I'm not sure again because of the limited interaction of the course, because of how much they interacted with the embedded librarian and I don't think that's a proxy of the embedded librarian, I think that's a consequence of the low enrollment" (instructor interview, lines 343-345). The theme of limited interaction is further analyzed in the discussion section.

Literature search capabilities of the participants

In a discussion of faculty literature search patterns, the course instructor commented: "I think like many other faculty members I struggle to try to figure out when I should be interfacing with the academic librarians myself and probably as guilty as the next person of underutilizing and being over confident in my abilities to appropriately search" (instructor interview, lines 7-10).

Many of the themes uncovered in analysis of the interview data are related to the influence of the embedded librarian on the course participants, but an important consideration in an embedded librarian project is the collaboration between the course instructor and librarian. The librarian researcher took the opportunity when interviewing the instructor to elicit feedback regarding not only the collaboration during this embedded librarian project, but also future collaborations between teaching faculty and academic librarians. Further discussion of this theme will be used to triangulate the case study data in the next section.

Summary of Findings

While there was only one interaction between the embedded librarian and a course participant, log data indicates that the instructional materials were utilized. Paired t-test analysis of pre- and post-implementation assessments indicated a significant difference between the pre-test and post-test means.

When participant annotated bibliographies were analyzed, both subject and objective rubric scores were high. An analysis of participant reflections revealed several major themes, including: the nature of the annotated bibliography assignment and critical analysis required in the annotations, use of the library instructional materials, the literature search process in general and specifically the search terms and strategies used within the process, and the process of finding useful and relevant articles. Themes from the instructor interview include an emphasis on the quality of participant annotated bibliographies, the use of library instructional materials, limited interaction between the students and librarian, and finally the literature search capabilities of the participants. Log data indicates that the instructional materials were utilized. Paired t-test analysis of

pre- and post-assessment indicates a significant difference between the pre-test and

post-test means.

Table 4-1. Embedded library instructional material access

Resource Name	Times Accessed
VPN Installation Video	2
Library Help	2
OnMed LibGuide	7
Refworks Handout	6
Refworks Elluminate	0
Searching Ulrich's	7
Peer Review & Ulrich's	9
JCR Video	4
ERIC Demonstration	11
MeSH Demonstration	7
Search Support	6

Table 4-2. Paired t-test results for the self-efficacy assessment

Test:	N	Mean	SEM	Median	Mode	Std. deviation	Variance	Range
Pre-test	14	3.058	.2464	2.875	2.0	.9221	.850	3.17
Post-test	14	4.232	.1242	4.375	4.5	.4647	.216	1.75

Key: 1= Not confident, 2= Somewhat Confident; 3=Neutral, 4= Confident; 5=Very Confident, N=number of questions

Table 4-3. Descriptive statistics for each participant

Participant	Test:	N	Mean	Δ Mean	SEM	Median	Mode	Std. dev	Variance	Range
1	Pre	14	2.214	.714	.3176	2.000	1.0	1.1883	1.412	3.00
	Post	14	2.928		.2864	2.500	2.0	1.0716	1.148	3.00
2	Pre	14	3.5714	1.143	.2716	3.500	3.0	1.0165	1.033	3.00
	Post	14	4.7143		.1252	5.000	5.0	.46881	.220	1.00
3	Pre	14	2.2143	2.643	.3805	2.000	2.0	1.4238	2.027	4.00
	Post	14	4.8571		.0970	5.00	5.0	.36314	.132	1.00
4	Pre	14	3.357	.859	.3722	4.00	4.0	1.39286	1.940	4.00
	Post	14	4.4286		.2020	5.00	5.0	.75593	.571	2.00

Key: 1= Not Confident, 2= Somewhat Confident; 3=Neutral, 5= Confident; 5=Very Confident, N=number of questions

Table 4-4. Citation analysis summary

Statistics	Objective Rubric	Subjective Rubric
N	6	6
Mean	2.835	18.00
Std. Error of the Mean	.0224	.5164
Median	2.850	17.50
Mode	2.85	17.00
Std. Deviation	.0550	1.265
Variance	.003	1.600
Range	.15	3.0
Legend	Out of 3.0 points	Out of 20 points

Table 4-5. Descriptive statistics of citation analysis

Bibliography ID	Objective Rubric Score	Subjective Rubric Score
A	2.75	17
B	2.79	18
C	2.9	20
D	2.85	17
E	2.87	19
F	2.85	17
Mean	2.835	18

Table 4-6. Reflection themes with examples

Theme	Examples
Annotated Bibliographies and Critical Analysis	I approached the annotations as though I was going to use them to write a manuscript which helped.
	I was really not getting it until I realized that it is essentially a summary of what I grasp from a research paper when I am reading it to quote in a manuscript.
	It is just a formal term for summarizing the paper's pertinent points and looking up additional papers that support or refute it.
	I realized these were the steps that I had been missing that forced me to slow down and review the articles in a way to know what direction to take my project.
	It also helped to see what design and statistical analysis methods were used
Library Instructional Materials	how I should further evaluate the pre and post survey information that I have collected
	The videos from the librarian were helpful to understand the annotation concept and how it is used.
	tips I picked up from the instructional tutorial on annotated bibliographies
	what I used and learned from the tutorials
	I certainly utilized some of the resources provided by the librarian (e.g., "What is an Annotated bibliography?" instructional video, journal citation reports and searching Ulrich's video
	I did use the brief educational segments by the librarian
Search terms and strategies	I still have an elementary understanding of how to decide on terms and combine them in such a way as to produce a useful list of articles.
	I still struggled a bit during the search
	my confidence in my ability to conduct sound searches
	Finding out about the MeSH search terms did help.
	finding the correct search terms

Table 4-6 Continued

Theme	Examples
Finding useful and relevant articles	challenges I had with this assignment were finding publications that were relevant but not repetitive.
	finding the correct search terms to get the articles that answered my question.
	literature on it has literally exploded so it is hard to sort through what is relevant and what is not.

CHAPTER 5
DISCUSSION, IMPLICATIONS, AND CONCLUSIONS

Introductory Remarks

As the occurrences of face-to-face and online course level embedded librarians increase (Bozeman & Owens 2008; Edwards, Kumar & Ochoa 2010; Dewey 2004; Dugan 2008; Freiburger & Kramer 2009; Hall 2008; Lillard et al. 2009; Kesselman & Watstein 2009; Matthew & Schroder 2006; Rudin 2008; York & Vance 2009), the importance of describing and evaluating instances in which embedded librarians are active in online courses (often taking a leadership and/or instructor role) is paramount to their successful continuation (Bowler & Street, 2008; Edwards, Kumar, & Ochoa 2009; Lillard et al. 2009). The purpose of this project was to describe a particular case of an online embedded librarian and evaluate the manner in which the librarian influenced course participants. Specific contextual features of this case included the status of the students as full-time health care professionals in addition to their status as graduate educational technology students. The librarian researcher used best practices from the literature and instructional design principles to develop an embedded librarian program customized to the needs of the OnMed students.

A mixed methods case study was designed and implemented to describe and evaluate the librarian's impact upon the students. Data collection occurred during the spring 2 term (March 6th – April 22nd). Data collected includes Moodle access data regarding the number of times resources were viewed, pre/post-tests to measure information literacy self-efficacy and library skill performance, a citation analysis of sources used in participants' annotated bibliography assignments, narrative reflections from all participants, and an interview with the course instructor. Quantitative data

analysis indicated that the instructional participants viewed the instructional content and results of the paired t-test showed a significant difference between pre and post-test scores. Emergent themes from the qualitative data focused on use of the library instructional materials, participants' prior library experience, and the literature search as a concept and process.

This chapter discusses triangulation of the variety of data, discusses the major findings, transitions to a discussion of the findings in relation to the literature, describes the threats to validity, and finally presents the implications, suggestions for future research, and conclusions.

Triangulation

In a mixed methods case study the diversity of data (both sources and types) require that the data be triangulated to construct and support working theories concerning the librarian's influence (Yin, 2009). Of the four types of triangulation discussed by Patton (2002), triangulation of data sources was conducted in this study because all the data is aimed at corroborating the impact of the embedded librarian. Primary data sources include Moodle access log data, pre and post-test scores, citation analysis data, and reflective data. Additionally, the instructor interview and librarian researcher's informal observations (documented in a Google docs log) assisted with data triangulation and served as check points to inform the findings.

Moodle log data supports the reflective data concerning library instructional materials, and both sources indicate that learners accessed the materials. Participants' commented specifically on their use of the library instructional videos: "I did use the brief educational segments by the librarian…about ERIC, etc" (OnMed reflections, lines 35-36), which is demonstrated by the number of times the materials were accessed. As an

additional data point, the course instructor's perspective regarding the instructional

content is consistent with both the log data and the narrative reflections. Additionally,

the instructor reflected upon not only the use of the instructional materials, but their

quality and the idea that they were instructionally sound: "I think the materials that you

developed were not just instructionally sound from a librarianship perspective, but also

from an instructional design perspective" (instructor interview, lines 14-17). It is evident

from analyzing both data sources (Moodle log data and participant reflections) that the

instructional content was utilized, and this observation was supported by the course

instructor.

By analyzing the pre- and post-test results, it was determined that prior to the

embedded librarian experience, information literacy self-efficacy scores were

comparatively low contrasted to the post-test scores (the pre-test scores ranged from

2.21 to 3.57 where post-test score ranges from 2.9 to 4.7), which reflects moderate

confidence in information literacy skills. On average, the difference between pre-test

and post-test scores was 1.17. See Table 5-1 for a summary of the scores. This

quantitative data outcome is supported by the participant reflections as several

commented specifically on low searching confidence and/or anxiety with literature

searching: "I find the literature search quite daunting" (OnMed reflections, lines 110-

111). Post-test results that demonstrate increased confidence is supported by the

findings from the citation analysis, which indicate that participants used high quality peer

reviewed sources.

An additional theme from the data analysis concerns the literature search process,

specifically, difficulties in locating relevant articles. Several participants commented that:

"The biggest challenges I had with this assignment was finding literature on electronic medical records relevant to my research" (OnMed reflections, lines 49-50), and this was observed in the subjective citation analysis results, as some citation lists received 3 out of 4 points for article relevancy.

Reflections comment on a lack of interaction with the embedded librarian, which is a theme supported by observations from the librarian researcher's field notes. Learners were not required to interact with the librarian in the discussion forum, but they were strongly encouraged to view the instructional materials and complete the pre- and post-implementation assessments and reflections. A defining feature of a course level embedded librarian is the librarian's presence within the course (Lillard et al., 2009; York & Vance, 2009), and a comment from one of the participants suggested that the librarian researcher's presence was not felt within this course: "but I honestly did not necessarily "feel" the presence of the librarian during the course" (OnMed reflections, lines 74-75). However, the librarian researcher's field notes describe several attempts to engage students and participate in the course:

> Thursday March 10th: The instructor's "why are we doing this" post and mention of information makes me happy. I think it fits in well with the information literacy and health care accreditations part of the embedded librarian presentation I just gave. I'll adapt the information literacy content to the needs of this course to highlight the links between accreditation standards and information literacy (field notes, lines 15-20)

> No one is commenting on my announcements in the discussion forum – I wonder if they're reading them? I posted the presentation to the discussion forum. (field notes, lines 35-36).

Specific examples of attempts to interact with and engage students include creating and posting relevant information literacy content on an as needed basis or "on the fly" (e.g. a five-slide video clip illustrating the connections between information literacy and the

accreditation documents from the health science colleges), posting announcements and reminders for relevant presentations, and posting links to interesting sites to support the objectives of the course. Additionally there was a prominent Meebo chat widget in the course to facilitate instant messaging as a medium for contacting the librarian.

The instructor commented that the lack of active discussion issue was a factor affecting the entire course, not just the library content:

> This course was very frustrating because it only consisted of seven students. So from an online instructional perspective it was a bear. I would have rather lumped these students in with the masters students or actually probably with the EdD students and taught a larger cohort. Then the students would have fed off of each other to a larger degree, there would have more opportunities for organic discussion. When there are seven students its literally impossible to get any sort of discussion dialogue going in an asynchronous context. (instructor interview, lines 85-91)

From the interview, it appears as if the course instructor noticed the librarian researcher's attempts to engage the students and hypothesized that the lack of interaction was due (at least in part) to the small class size:

> I'm not sure again because of the limited interaction of the course, because of how much they interacted with the embedded librarian and I don't think that's a proxy of the embedded librarian, I think that's a consequence of the low enrollment. I think this experiment was heavily impacted by low enrollment numbers. And even if we were even to focus on these seven individuals if you added another eleven into the mix you think you would have a very different course dynamic. (instructor interview, lines 343-347)

In addition to commenting on the lack of felt presence, the participant also made suggestions for how the librarian can increase student interactions including: "She can certainly highlight the resources (the tutorials) that will be used throughout the course more. I think she can also elaborate on how she could help us with searches" (OnMed reflections, lines 81-83).

Discussion of Major Findings

Research Question: How does the presence of an online embedded librarian influence graduate students experience in an online educational technology research class?

Analysis of the quantitative measures of information literacy self-efficacy and qualitative reflections of the experience lead to the conclusion that the embedded librarian had a positive impact upon OnMed students enrolled in the EDG 6931 course. The pre- and post-test scores for information literacy self-efficacy illustrated a significant increase in self-efficacy. From the reflective comments regarding usage of the instructional content, one can conclude that viewing the librarian created instructional content at least temporarily improved information literacy self-efficacy.

Scores for the citation analysis (both objective and subjective measures) were consistently high, demonstrating that the participants used high quality sources in their annotated bibliography; however, it is not possible to correlate the high quality bibliographies with the embedded librarian or any other single factor. The course instructor also noted the high quality of student submissions and suggested that students' status as experienced academic health care professionals is one possible explanation (instructor interview, lines 23-25; 353-358). One of the citation analysis criteria is related to the type of resource cited, with peer reviewed articles receiving the highest point value. The library instructional content directly addressed this, as one of the videos demonstrated how to use a tool to determine the peer review status of a publication. Student reflections commented on the usefulness of that specific video, which provided further empirical evidence to support the usefulness of the embedded librarian.

Librarian presence

Findings suggested that participants did not experience the librarian's "presence" within the course beyond the existence of the customized library instructional content. Lack of presence is described in participant reflections: "but I honestly did not necessarily 'feel' the presence of the librarian during the course" (OnMed reflections, lines 74-75). However, the learner goes on to comment that although the presence of the librarian was not felt (perhaps in terms of learner-librarian interactions), the existence of the customized instructional content is evidence of "librarian presence": "Reflecting back on what I used and learned from the tutorials and thinking about the latter part of the previous sentence I recognize it is not a fair statement. The embedded librarian provided support without me realizing it" (OnMed reflections, lines 75-78). This statement corroborates not only the fact that the instructional materials were used, but also that the learner-content interactions were a reflection of librarian presence whether or not participants realized them as such.

Narrative comments from the course instructor and librarian researcher support the findings regarding lack of interaction with the librarian. Moore describes three types of interaction: learner-learner interactions, learner-content interactions, and learner-instructor interactions (Moore, 1986). Learner-learner interactions can be described as "intra-learner" interactions; learner-content interactions occur between the learner and the content or subject being studied; and finally, learner-instructor interactions describe interactions between the learner and the instructor, content creator, or subject expert. While learners did not interact with the librarian synchronously or asynchronously through the discussion boards, chat, or email, the learners did interact with the librarian-

created instructional content. Analysis of the assessment, citation analysis, and reflective data demonstrates the efficacy of the learner-content interactions.

Prolonged sustained contact with a librarian who is actively integrated into a course is one of the features of an embedded librarian. One of the benefits of this level of contact is to allow the learners to become familiar with the librarian. Increasing learner familiarity with the librarian is an attempt to decrease anxiety about approaching a librarian (Collins & Veal, 2004; Jiao, Onwuegbuzie, & Lichtenstein, 1996; Mellon, 1986, 1988; Kuhlthau, 1988, 1991; Onwuegbuzie, 1997). By decreasing the well-documented uncertainty about asking a librarian for help, an embedded librarian hopes to increase likelihood of being approached by learners with an information or access need. With only one direct learner-librarian interaction during the course, it is difficult to determine if the librarian's presence influenced any possible anxiety the participants may have had about approaching the librarian.

While the learners indicated that they did not interact with the librarian or experience "librarian presence" within the course, the librarian researcher was astutely aware of her presence within the course and found being integrated into the course beneficial for a variety of reasons. Librarian benefits of being embedded included the ability to create instructional materials customized to the course content, participate in course discussions and create material quickly as needed in response to discussion topics and organically as discussions evolved, and see the participants' research topics evolve from a list of potential ideas to the final topic. In having access to the course, the librarian was able to better understand the course and the ways in which library and information literacy content could contribute.

Additional findings

While the research question focused on the embedded librarian experience from the students' perspectives, the variety of data (including the instructor interview and librarian researcher's field notes) lent itself to additional findings related only tangentially to participant experience. One of the significant findings related to faculty collaboration for course integrated and embedded instruction. The course instructor supported collaborations and made recommendations for future collaborations:

> but I don't think it would be unreasonable to potentially assign folks to specific courses. Maybe not in the context we're talking about a course of seven people, but what about for large courses, for pharmacy for dentistry, medicine and not just online courses, but face to face courses. If anything you could collaborate with the instructor and strengthen their materials (interview, lines 239-243).

Related to faculty library collaboration is the idea of creating customized library instructional content. Content in the OnMed embedded librarian case study was created specifically for academic health faculty researching clinical as well as educational topics. Collaboration with a faculty member facilitates the close integration of library content to the needs of a course (Bozeman & Owens, 2008; Chesnut et al.., 2009; Dugan, 2008; Hall, 2008; Matthew & Schroeder, 2006; Stewart, 2007; Tennant & Miyamoto, 2002; York & Vance, 2009). Without the collaboration between librarian and course instructor, access to the course syllabus and content may not have occurred as early in the design process, if at all.

Collaboration with the course instructor and a detailed review of the course content allowed the librarian to capitalize on knowledge of both the subject matter and the course content as well as information science centric domain knowledge. An example of the benefit of librarian/instructor collaboration is demonstrated in the post course

interview. A discussion of levels of evidence and the hierarchical nature of publications turned into a discussion of primary versus secondary sources and lead to the instructor's recognition of the necessity of reinforcing that concept for students.

Discussion Summary

One of the defining features of this case was the close integration of the library instructional materials to the course goals and objectives. Data indicated that the library instructional content was a valuable addition to the course and that learner-content interactions occurred. The librarian researcher was well positioned to create such customized content because of her background in both educational technology (and familiarity with the course content) and medical education/medical literature searching practices. While not all subject or liaison librarians will have as much familiarity with the course content as was demonstrated in this case, customization of online library instructional content is still possible through the use of an instructional design model, thorough needs assessment, and close collaboration with faculty.

Interactions in this case were primarily categorized as learner-content interactions because the students used the instructional content developed by the librarian, which could lead to the conclusion that the most useful feature of course integrated embedded librarians is the instructional content. While that is an accurate statement in this case, other research suggests that librarian presence and learner-librarian interactions are defining elements of embedded librarianship (Bowler & Street, 2008). Their research was conducted with undergraduate level humanities courses, a context with learner characteristics and needs differing from the OnMed case. The difference in findings between other embedded librarian studies and the OnMed evaluation study can be

attributed to contexts, including the small class size, learner characteristics and prior experience with information literacy and library skills.

Despite the lack of librarian presence felt in this implementation of an online embedded librarian, the positive impact on self-efficacy demonstrates that it is still a valuable experience for the students, instructor, and librarian. The fact that interaction with the participants was lacking and the librarian "presence" was not felt by participants can possibly be attributed to the unique features of the context and may not necessarily generalize to all online embedded librarian scenarios.

<div align="center">

Findings and the Literature

</div>

Embedded Librarianship

Primary findings relate to the positive impact the embedded librarian had upon participant information literacy self-efficacy, the "presence" or lack thereof of the embedded librarian (specifically relating to interactions with the librarian), and faculty librarian collaborations. Presence in the context of an embedded librarian refers to the prolonged availability of the librarian within the course and interactions between the librarian and learners (Dugan, 2008; Hall, 2008; York & Vance, 2009). Interaction in the general sense of an online course refers to the various types of interactions in a distance or online course described by Michael Moore. (Moore, 1986). Each of these specific themes will be discussed in relation to the literature after a discussion of the broad theme of the online embedded librarianship literature and the findings of this case study.

Best practices described in York and Vance's (2009) review of librarians embedded into online courses focused on linking the librarian with the CMS (course management system), careful selection of courses in which to embed the librarian,

active librarian participation in the course, and marketing the service to other faculty members. Many of these recommendations were integrated into the design of the embedded librarian implementation developed for the OnMed course, thus providing additional supporting evidence for the usefulness of York and Vance's literature analysis recommendations.

In order to investigate the efficacy of various levels of course level embedding, Bowler and Street (2008) designed several experimental face-to-face embedded librarian instances with differing levels of integration. The researchers found that a higher level of librarian integration with more student interaction with the librarian resulted in a significant improvement in student scores on a standardized information literacy rubric. The Bowler and Street findings indicate that a high level of integration and presence is preferred; however, the research was conducted in a traditional face-to-face classroom, and the extendibility of these findings to online courses has yet to be investigated. Despite this difference in setting, these results do not support the findings in the OnMed case, which indicate that presence is not as influential as customized instruction.

The Lillard et al. (2009) embedded librarianship implementation served a dual purpose: to prepare library and information graduate students (nascent librarians) to serve as online embedded librarians and to investigate embedded librarianship in online graduate nursing courses. The authors found that the experience was generally positive for the student embedded librarians, graduate nursing students, and faculty. Key conclusions from this project reinforce York and Vance's (2009) recommendations regarding course selection and collaboration.

Feedback from the nursing students enrolled in courses with embedded librarians indicates that the usefulness of the embedded librarian was related to the course topic and where in the curriculum the course occurred. Several students commented that the instruction and embedded librarian experience would have been more beneficial if it had occurred earlier in their program (Lillard et al. 2000). These findings could inform findings from the OnMed embedded librarian case. While the EDG 6931 course occurred relatively early in the OnMed curriculum (in the second semester) and the Lillard et al.. findings suggested that early placement is beneficial, students' status as experienced health care professionals could have influenced their use of the embedded librarian. Their prior experience provided them with more opportunities for library instruction, and the practice of evidence-based medicine provided opportunities to apply information literacy skills emphasized by the embedded librarian. The "experience factor" involved with the OnMed students was also noted by the course instructor when he commented that the level of work they produced was similar to that of first semester doctoral students rather than beginning Masters students (instructor interview, 23-25; 353-358).

Data from the library student reflections in the York and Vance (2009) study indicated their experience as embedded librarians was directly related to the amount of communication between themselves and the faculty instructor and the freedom of communication allowed between the librarian and nursing students enrolled in the course. Clearly in the York and Vance instances of embedded librarianship, the experience of the "librarian" and the overall "presence of the librarian" in the courses were influenced by interactions with the students. The issue of librarian presence within

the course and interaction with the students was a key finding for the OnMed study and warrants further investigation.

Summary of the Findings in the Context of the Literature

Although the description and assessment of these projects was not as thorough as the OnMed case study, they provide evidence in support of the study's findings that the online embedded librarian is a valuable experience for students and can foster further collaboration between librarian and faculty. The OnMed embedded librarian project provided outcomes that mirror findings from the literature, but it also extended them as it is a more multifaceted, in-depth analysis of embedded librarianship in a particularly unique setting of learners who have dual roles as graduate student and academic health faculty. By providing a rich case study of an online embedded librarian implementation, this project can serve as a model for future investigations of other online embedded librarian contexts.

<center>**Threats to Validity**</center>

While the study was designed with validity in mind by implementing methodological measures including the use of validated instruments, member checking, and an audit trail, it is impossible to protect against all threats to validity. Factors such as the size and selection of the case, course content and specifics of the population all contribute threats to validity. While there is no minimum number of participants necessary for a case study (Yin, 2009), it is clear that the number of participants in this case negatively impacted the course dynamics and interaction, which could have affected the results. Additionally, the specialized population of heath care professionals influenced results, and it is not clear to what extent the results would generalize to another context. One possible solution to these issues would be to conduct a multi-case

study and use another larger, more typical case in addition to the OnMed case. The use of other study designs including an experimental or quasi-experimental approach would allow for more control of other potential confounding variables.

Implications

Overview

Results and implications in this study inform practice in several areas and are discussed in terms of Kirkpatrick's Evaluation Model (Kirkpatrick & Kirkpatrick, 2006). The Kirkpatrick Model was developed in the 1950's by Donald Kirkpatrick to evaluate training programs and includes four evaluation levels (Kirkpatrick, 1959a; 1959b; 1960a; 1960b). Level one is the most basic and assesses the learners' reactions to the training; level two assesses learners' knowledge gained as a result of the training; level three assesses the extent to which the training influenced learners' subsequent behavior; and level four assesses outcomes and results based on the training. The four levels can be thought of in a hierarchical manner with level one at the bottom and level four on top; Figure 5-1 illustrates this concept. Kirkpatrick's Evaluation Model was selected for this project particularly because it is a commonly used model (Alliger & Janak,1989; Cascio,1987) that may resonate with stakeholders interested in the results of this study. Implications are categorized broadly into three areas: implications for the practice of librarianship, administrative and policy implications, and educational and curricular implications.

Implications for Professional Librarianship

Findings from this and other studies support the efficacy of embedding librarians into online courses (Bowler & Street, 2008; Edwards, Kumar & Ochoa, 2010; Lillard et al.., 2009; York & Vance, 2009; Shumaker & Talley, 2009). However, the findings

highlight the necessity of careful consideration of the course and audience prior to initiating an embedded librarian and during the designing of the embedded librarian content. Prior to planning and implementing an online embedded library program, librarians must carefully consider the curriculum to select appropriate courses, collaborate closely with instructional faculty, and employ an instructional design plan that includes a thorough needs assessment. It is imperative that the design of the embedded library content, including instructional materials and interactions, be tied to the needs of the learners and the course. For example, an entry level online undergraduate course that was designed to be highly interactive may require more "presence" from an embedded librarian than an online graduate course with highly experienced learners.

In order to maximize student impact while balancing the time investment necessary for embedded librarian projects, librarians should work closely with the course instructors to assess the needs of the course and learner characteristics prior to implementing an embedded librarian program that features interaction with the librarian. In addition to careful course selection and instructional design, librarians embedding themselves in online courses should familiarize themselves with strategies used to increase learner interactions and best practices for establishing an online teaching presence.

Implementing the recommendations above will help to make the embedded librarian design and development process more efficient and effective; however, there is still an intensive time commitment required. There is the potential for librarians to be overwhelmed with meeting the needs of students enrolled in the course with an

embedded librarian and balancing other responsibilities. For example, in one instance of an embedded librarian in the HSC library, the librarian is integrated into the foundational course for the online professional program in the college to which she liaises. The librarian interacts with students in the foundational course but is also responsible for supporting the needs of the entire program (approximately 600-800 students) and the college at large, which includes several other large programs in addition to the faculty members. Given the large number of potential users this liaison librarian supports, a high level of involvement in the course in which she is embedded can be overwhelming and lead to increased stress and potentially decreased effectiveness. The conditions in which a librarian can successfully embed in a course and the degree of integration must be determined by the librarian, library administration, and the faculty and administration in the college and/or program in which the embedding will occur.

In addition to these recommendations for practicing librarians, the study has implications for the education of practicing and future and librarians. Embedded librarianship as demonstrated in this study (librarians embedded into courses or the curriculum) requires a set of skills that the librarian researcher, but not necessarily all academic librarians, possesses including knowledge of instructional design models, learning theories, and educational technology. Steven Bell and John Shank describe librarians with these skills as "blended librarians" (Bell & Shank, 2004). A blended librarian is: "an academic librarian who combines the traditional skill set of librarianship with the information technologist's hardware/software skills, and the instructional or educational designer's ability to apply technology appropriately in the teaching-learning process." Academic libraries are acknowledging this need by actively recruiting

108

librarians with these skills. An analysis of position advertisements demonstrates that fewer than twenty-four library job announcements in 2003 used the phrase "instructional design/er and of that total there were only 10 announcements that were not reposting earlier advertised positions (Shank, 2006). The Shank study analyzes the knowledge, skills, and abilities described in the position descriptions to define key characteristics for librarians whose primary responsibilities focus on educational technology and instructional design. In seeking to hire instructional technology librarians and reference and instructional librarians with some instructional design skill, academic libraries are responding to the shifting nature of academic librarianship. Clearly academic libraries recognize the importance of instructional skills, but when, how and where do librarians acquire these skills?

Options for providing these instructional skills fall into two broad categories; educating future librarians and educating practicing librarians. A broad, far-reaching solution involves changes to the graduate school curricula for library and information science programs. An examination of the course listings of the graduate school programs listed by US News and World Report in their "Best Graduate Schools" reveals that, with the exception of media specialist certification requirements, a minority of the Master's Degree programs do not include instructional design or educational methods courses, As academic librarians are increasingly engaged in designing and delivering instruction, formal preparation in learning theories, instructional design and pedagogy/andragogy would more fully prepare librarians for their instructional roles.

While this is an optimal strategy for library education, curricular changes require large scale institutional adjustments and take time to plan and implement. Therefore, it

is important to continue to provide practicing librarians with opportunities to develop and cultivate instructional knowledge and skills. This continuing education can occur at various levels including within the library, on campus, and through regional, national, and international conferences and professional organizations. Libraries sponsor and facilitate professional development on a variety of topics, which should include quality offerings designed to provide both theoretical and practical knowledge and skills relevant to instruction.

Another source of professional development and support that should not be overlooked includes campus based resources, instructional centers and institutes, similar to the University of Florida's Center for Instructional Teaching Technology (CITT). UF's CITT provides faculty with training on a variety of instructional design and technology topics. In addition to offering training, CITT staff also provides instructional design and development support to produce instructional content. Academic librarians should make use of these local sources of continuing education and professional development, which are often provided at low or no cost to the individual, to enhance their instructional knowledge and skills.

Beyond these readily available, economically feasible continuing education options there are additional sources at the national and international level. Professional organizations, both library and non-library organizations, are an important source of training opportunities. An example of an established, high profile program is the Association of College and Research Libraries' Information Literacy Immersion Program. According to their website, the goal of the immersion program is to provide librarians with a training experience designed to supplement their teaching, instructional

program planning, reflective teaching and assessment skills – specifically relating to information literacy concepts:

> ACRL's Immersion Program provides instruction librarians with the opportunity to work intensively on all aspects of information literacy. Whether your institution is just beginning to think about implementing an information literacy component or whether you have a program well under way, the Immersion Program will provide your instruction librarian with the intellectual tools and practical techniques to help your institution build or enhance its instruction program (ACRL, 2011)..

While anecdotal evidence from practicing librarians support the efficacy of these programs, registration fees range from $1,875-$1,975 depending upon membership status, and the high cost can be prohibitive. Therefore, it's important for librarians to consider other avenues of continuing education including sessions offered at professional conferences. Conferences offer formal continuing education opportunities in the form of workshops and informal development from conference presentations. In many academic libraries attendance and participation in professional conferences is required or highly recommended and with varying amounts of financial support allotted. By coupling conference attendance with formal and informal continuing education in a conference setting, librarians maximize the time and financial investment required for those activities. Another option for academic librarians serious about gaining instructional design knowledge and skill involves taking credit bearing graduate level course work beyond that required for the library science degree. This can be done through a college of education for either a post-graduate certificate or for an additional graduate degree. Colleges of education, including the University Of Florida College Of Education are offering increasing numbers of certificate and Master's degree programs online targeting practitioners.

Findings from this case study indicate that high quality embedded librarian programs positively influence student outcomes, and in order to design and develop successful implementations, academic librarians need to be able to acquire and develop their instructional knowledge and skills, formally and informally.

Policy and Administrative Implications

This study evaluated a single use case of an embedded librarian instance. While results demonstrate benefit to both the students and the instructor, the benefit was limited to a very specific group of users, and the overall impact of the librarians' time and intellectual investment is undetermined. In order to increase the institutional impact of course integrated embedded librarians, similar projects would need to be implemented in other colleges, departments, and programs. In fact, wide-scale campus implementation of course-level embedded librarians was a recommendation resulting from the interview with the course instructor (instructor interview, lines 236-237). While theoretically it may be beneficial to use this model to embed librarians in courses campus wide, the model may not support expansion of that level.

As mentioned previously in relation to this project, and in the embedded librarian literature (Bozeman & Owens 2008; Edwards, Kumar & Ochoa 2010; Dewey 2004; Dugan 2008; Freiburger & Kramer 2009; Hall 2008; Lillard et al. 2009; Kesselman & Watstein 2009; Matthew & Schroder 2006; Rudin 2008; York & Vance 2009; Shumaker & Talley, 2009; Tennant & Miyamoto, 2002), embedding a librarian in courses requires a significant time investment from the librarian. Each stage of the instructional design process, beginning with the needs assessment to collaboration with the faculty member and the development of instructional materials, is time and labor intensive, but crucial to the success of the project. In addition to investing time in developing customized

integrated instructional materials, a truly embedded librarian will devote time to participating in the course in which they are embedded, including offering support and interacting with the learners and/or instructor.

While librarians may be willing to devote the intensive amount of time to embedding themselves into courses, unless the role of "embedded librarian" is their only function in the library, doing so may limit their ability to perform additional vital functions that support the library and their career, especially in institutions where librarians are tenure-track faculty. There are several potential solutions to this dilemma, designed to help the individual embedded librarian and the library achieve some return on their time and invest in resources necessary to produce a quality, successful embedded librarian product.

One potential solution to this problem is to create instructional materials that are reusable. In this case study, the instructional content developed by the librarian researcher was reused for a similar audience of medical educators and modified and repurposed for other audiences, thus extending the usability of instructional content and expanding the benefit beyond the OnMed embedded librarian project. However, the fact that the instructional materials were ostensibly developed for a specific group can possibly curtail the reusability of the materials so that they are only useful to reuse with a group similar to the one for which they were designed. It may also be feasible to design and develop templates with details and examples based upon a pre-determined framework, which librarians can use to facilitate and hasten the development of instructional materials.

Another solution to extend the benefit of the time investment is to turn the service focused instructional project into a research project by participating in the scholarship of teaching and learning (SoTL). In conducting SoTL research related to the embedded librarian duties, librarians and their institutions can achieve some return on their time investment by disseminating and publicizing library research and supporting retention through the tenure and promotion process.

If an institution or library decides to implement course level embedded librarian programs regardless of the time involved with the endeavor, there may be other less tangible ways to recoup some of the lost investment. Evaluating embedded librarian programs in these terms can be seen as a discussion of return on investment, is an example of a Kirkpatrick level four evaluation (evaluating results) (Kirkpatrick & Kirkpatrick, 2006) and has direct policy and administrative implications. Intangible benefits include supporting accreditation (at both the regional level i.e. SACS and the college level) and supporting patient care through improved patient outcomes. The following paragraphs discuss both the issue of accreditation competencies and patient care outcomes as they relate to course level embedded librarianship in a health science center.

The context of this project was focused on providing curricular library support in an academic health science center (known as the academic health center – AHC); therefore this discussion of accreditation standards focuses on the accreditation standards of four of the six colleges comprising the AHC, including the colleges of Dentistry, Medicine, Nursing and Pharmacy. The fifth and sixth unmentioned colleges are the College of Health and Health Professions (CoPHHP) and the College of

Veterinary Medicine (CoVM). The CoPHHP will not be discussed because it contains several distinct programs, all with varying accreditation requirements. The CoVM will not be discussed because the term patient care is being limited to human patient care in this study.

Accreditation standards for each of the four colleges all reference the skills and abilities described by the Association of College and Research Libraries (ACRL) in their definition of Information Literacy. See Figure 5-2 for a visual alignment of the ACRL Information Literacy definition with the similar terms and phrases used in accreditation. A course level embedded librarian supports students' acquisition of these skills by creating targeted instructional content designed to foster information literacy and encouraging and participating in critical thinking discourse, which facilitates application and synthesis level cognitive tasks (Bloom, 1956). There is a link between the skills described in the accreditation standards and information literacy; however, the phrase "information literacy" is not used directly in any of the standards, which can create difficulties for libraries attempting to connect their services to accreditation standards for the purposes of marketing, support and funding. Library administration must find ways to highlight the connections between information literacy and accreditation, especially to significant stakeholders within the institution.

While the patient care outcomes associated with other manifestations of embedded librarians, particularly clinical librarians, are clear and well reported in the literature (Brettle et al., 2010; Swinglehurst, Pierce & Fuller, 2001; Wagner & Byrd, 2004; Weightman & Williamson, 2005; Winning & Beverley, 2003), the connection between patient care outcomes and course level embedded librarians are less clear and

direct but none the less appreciable. Specifically in the context of the OnMed cohort, in addition to being learners and graduate students themselves, the participants are also health care professionals all of whom are directly engaged in teaching students (undergraduates and graduates) and some of whom are providing clinical services. Clinical teaching, especially at the graduate level (during internships and residencies) directly relate to patient care outcomes (Chaudhuri et al., 2006; Clark et al., 2010; Lin, Shabbir & So, 2010; Oo, Grayson & Rashid, 2004; Thors et al., 2010). The embedded librarian is improving the efficiency and efficacy of the OnMed participants' literature searching abilities, which in turn supports their education and research processes. This can indirectly influence patient care through the improvement of their own patient care and the care of the patients for whom their residents and students will be responsible.

Curricular and Educational Implications

Data supporting the practice of embedding librarians in courses primarily assesses learner satisfaction and reaction (Kirkpatrick level 1) (Kirkpatrick & Kirkpatrick, 2006) but does not provide sufficient data regarding learning, behavior, or results, which is especially important when assessing new library services (Barton, German & Joint 2004; McKee 2010). This case study extends the current research and as such is one of the first investigations into measuring learning outcomes (Edwards, Kumar & Ochoa 2010) and detailed participant reflections in an online embedded librarian setting. While assessing satisfaction with instruments like "happy sheets" can provide interesting and useful feedback, it is important to consider more in depth evaluations and studies to take into account learning outcomes and student experiences with the embedded librarian (Barton, German & Joint, 2004; Bowler & Street, 2008; McKee, 2010; Weaver, 2010).

As a result of the focus on measuring learning outcomes (Kirkpatrick level 2) (Kirkpatrick & Kirkpatrick, 2006), the embedded librarian evaluation has potential curricular implications, especially for the College of Medicine, which is in the process of restructuring its undergraduate medical curriculum. The current medical curriculum includes a course on evidence-based medicine (EBM), and the new curriculum may include an evidence-based medicine thread. Librarians support both the practice of evidence-based medicine (Atlas, Smigielski, Wulff & Coleman, 2003; Kronefeld et al.., 2007; McCarthy, 1996; McGowan et al.., 2010; Mulvaney et al.., 2008; Rader & Gagnon, 2000; Rose, 1998; Scherrer & Dorsch, 1999 Tod et al.., 2007) and the teaching of evidence-based medicine to undergraduate medical students and residents (Atlas, Smigielski, Wulff, & Coleman, 2003; Bexon & Falzon, 2003; Bradley, Rana, Lypson, & Hamstra, 2010; Brown & Nelson, 2003; Dorsch, Jacobson & Schemer, 2003; Kem & Weiss, 2005; Koufogiannakis et al.., 2005; McCarthy, 1996). An embedded librarian in the evidence-based medicine curriculum can have profound implications by improving evidence-based medicine competencies, which may even translate into long term behavior changes (Kirkpatrick Level 3) and results (Kirkpatrick Level 4) (Kirkpatrick & Kirkpatrick, 2006).

One of the primary goals of embedding in the medical curriculum is to influence the learners' knowledge of and ability to implement evidence based medicine, which includes the following basic components: (1) correctly asking a clinical question (2) searching the literature (3) using the results to answer the question. Long term goals for embedding in the medical curriculum focus on improving patient care by improving clinicians' practice of evidence based medicine. Success is measured in terms of the

117

medical students' ability to incorporate evidence based medicine concepts, both theoretically and in practice.

Information literacy and evidence based medicine are complex concepts that are not (and should not be) distinctly measured using a standard assessment, such as the United States Medical Licensing Exam (USMLE). Therefore, evaluating the long-term outcomes of librarian involvement in the medical curricula requires a multifaceted approach designed to collect a variety of data, quantitative and qualitative, from a variety of sources. A comprehensive evaluation plan should collect a myriad of evidence from the learners themselves, from the instructors (didactic and clinical) and from librarians who interact with the learners.

Data from the learners includes artifact analysis of various written documents including those included in eportfolios, citation analysis of written documents (including the culminating assignment submitted in the second year evidence based medicine cours) , semi-structured interviews and focus groups. Another source of data from the medical students can come from the documentation required in the patient log. As medical students are logging their patient care exposures they can be queried as to whether or not they used the medical evidence in their decision making with a subsequent description of the clinical question, search strategy, search results, and how the literature influenced the clinical decision.

College of Medicine instructors (both lecture/didactic and clinical) are another significant source of evaluation data. The current curriculum includes an evidence based medicine course in the second year and the new curriculum redesign includes various tracks, with the possibility of an evidence based medicine track. Feedback from

the EBM course instructor gathered through semi-structured interviews can provide another source of data to evaluate medical students' evidence based medicine abilities and the impact of the librarian embedded into the EBM course. Similarly, clinical instructors, interns, residents and other clinical professionals working with clerkship students can be interviewed to evaluate the clinical EBM skills of medical students.

Librarians can provide a final source of evaluation information not to be overlooked. Data from the librarians includes contact statistics recording the incidences of medical student contact with librarians, type of contact (including whether or not it was an EBM related query), duration of interaction, and other descriptive information. Additional librarian data includes interviews, focus groups and field note observations from librarians supporting medical students.

While librarians have a clear influence on the evidence based medicine curriculum, the concepts of information literacy also impact medical students' research skills. The current curriculum includes a research track and all indications support the notion that the new redeveloped curricula will as well. Librarians can contribute to the success of students in the research track by supporting their acquisition and refinement of literature searching and critical analysis abilities.

Directions for Future Research

Findings from this study, particularly regarding the information literacy self-efficacy assessment, indicate that embedded librarians are beneficial to students and improve their information literacy self-efficacy and skills, primarily through learner-content interactions rather than learner-instructor (or learner-librarian) interactions. The findings may lead to the assumption that individuals are more interested in interacting with

library content rather than a librarian; however, these findings may be specific to the learners in this case. In cases similar to this featuring non-traditional learners who may have more prior experience with library research and information literacy concepts, it may be preferable to focus on collaboration with faculty and the creation of customized instructional materials rather than developing rich learner-librarian interactions. Further study is required to test the above assertion.

The development and analysis of this case uncovered several new questions, particularly regarding the "presence" of an embedded librarian in online courses. It is evident that there is a discrepancy between the experiences of the participants and the librarian researcher, which leads to several questions including:

- What factors contributed to the lack of interaction?

- What factors contributed to the perception that the librarian's presence was not felt?

- What could the librarian have done differently to increase interactions?

- How could the librarian have changed participant perceptions regarding the "presence" of the librarian?

- What could the instructor have done differently?

Additional studies further explore the presence of embedded librarians in online courses. These studies are based in other contexts, both in graduate and undergraduate settings, and were designed to determine whether the preference for learner-content rather than learner-librarian interactions is true of other types of students in other courses. These studies would hopefully make recommendations for strategies to increase learner-instructor interactions in future iterations.

Online interaction is related to online presence and communities of inquiry. The general education literature has a rich body of research describing communities of

inquiry and online presence. Garrison, Anderson and Archer (2000; 2001; 2002) are leading researchers in the area of communities of inquiry (COI). Their heavily cited 2001 article establishes a COI framework consisting of social, cognitive and teaching presence (Garrison, Anderson & Archer 2000), which is followed up by further research (Garrison, Anderson & Archer 2001; Garrison 2003) and a 2008 review of the COI research (Garrison & Arbaugh 2008). As Garrison, Anderson and Archer describe, the concepts social presence relates to the students' ability to represent themselves as "real people" in an online environment; cognitive presence is the use of reflection and communication (interaction and discourse) to construct meaning; and finally teaching presence describes the design and facilitation of process to enhance social and cognitive presence (Garrison, Anderson & Archer 2000). Findings regarding social and teaching presence in online courses could impact the roles of librarians embedded into online courses. The nature and extent of the impact is an area in need of further study.

Research concerning communities of inquiry, interaction and presence in online courses, influences librarians' roles as online embedded librarians and is related to and potentially dependent upon what role(s) the embedded librarian plays within the course. For instance, librarians who have more freedom and flexibility with their interactions with students enrolled in the course have more potential for interactions of all types. Librarians who have an instructor-like role within the course will interact with students in a manner similar to the course instructor while a librarian with a less formal role may interact with students in a manner that more closely resembles student-to-student interactions. Future research could focus on investigating librarians' roles in online

courses and determining how students interact with librarians and the ways in which librarians affect cognitive presence.

In addition to researching librarian presence, future studies could use other methodologies to further investigate a librarian's impact in online courses, including experimental or quasi-experimental designs with a control group to provide more rigorous empirical evidence of the efficacy of the embedded librarian.

By collecting a variety of data from learners, instructors, and librarians it is possible to comprehensively evaluate the impact of embedding librarians into the curriculum. Recently the HSC Library implemented a new addition to the existing librarian liaison program. While librarians liaise to colleges and departments, there has never been a librarian liaising specifically to medical students. To fill this gap the library decided to assign one librarian to liaison with a particular medical class. This approach will aid the evaluation process as it will allow specific librarians and interventions to be assessed and the impact tracked through the four year undergraduate medical curriculum.

Conclusions

As is demonstrated by the professional literature (Bozeman & Owens, 2008; Edwards, Kumar & Ochoa, 2010; Dewey, 2004; Dugan, 2008; Freiburger & Kramer, 2009; Hall, 2008; Lillard et al., 2009; Kesselman & Watstein, 2009; Matthew & Schroder, 2006; Rudin, 2008; Schumaker & Tally, 2009; York & Vance, 2009), librarians are being increasingly embedded or integrated into a variety of contexts including colleges, departments, research teams, and both online and face-to-face courses; it is clear that embedded librarianship is the future of academic librarianship. Embedded librarians are being used to provide contextualized instruction in the increasing number

of online courses being offered by institutions of higher education (Allen & Seaman, 2011). Evaluation is essential because this is a new service area. The embedded librarian implementation described in this project built upon experiences with a similar pilot project and best practices from the literature including customized instructional content, multiple modes of optional interaction with the librarian, and extensive faculty support and collaboration. However, this project extends the literature by using a multifaceted case study methodology to measure impact and explore participants' experience with the embedded librarian.

Both quantitative and qualitative methods were employed including a pre- and post-assessment of information literacy self-efficacy, citation analysis of student submissions, and participant reflections. A post course interview with the instructor and field notes from the librarian researcher further informed the findings. Results indicated an increase in self-efficacy and high quality annotated bibliography submissions, which are primarily attributed to viewing the instructional content rather than interacting with the librarian.

This project paved the way for future embedded librarian initiatives at the University of Florida and further collaborations between librarians and faculty as well as additional research regarding experiences with an online embedded librarian and librarian presence.

Table 5-1. Pre and post test scores for each participant

Participant	Test:	Mean	Δ Mean
1	Pre-test	2.214	.714
	Post-test	2.928	
2	Pre-test	3.5714	1.143
	Post-test	4.7143	
3	Pre-test	2.2143	2.643
	Post-test	4.8571	
4	Pre-test	3.357	.859
	Post-test	4.4286	
Mean	Pre-test	3.058	1.17
	Post-test	4.232	

N= 14;
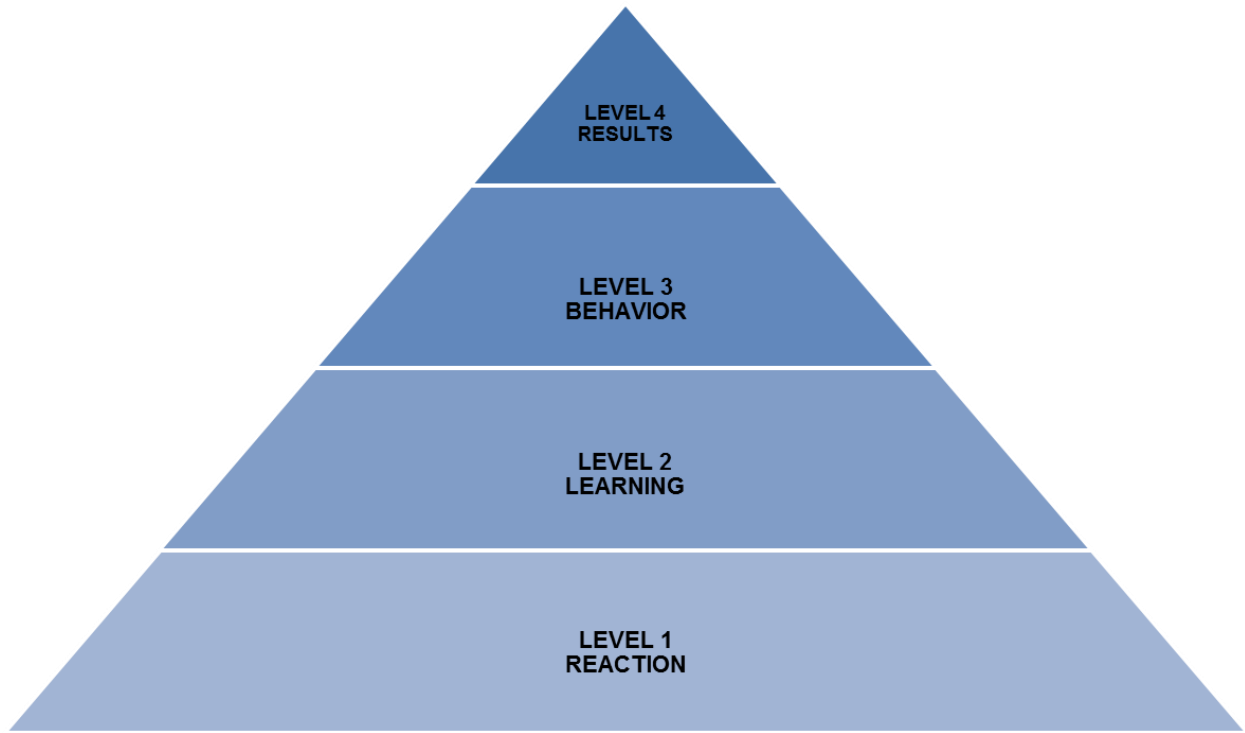Key: 1= Not Confident, 2= Somewhat Confident; 3=Neutral, 5= Confident; 5=Very Confident, N=number of questions

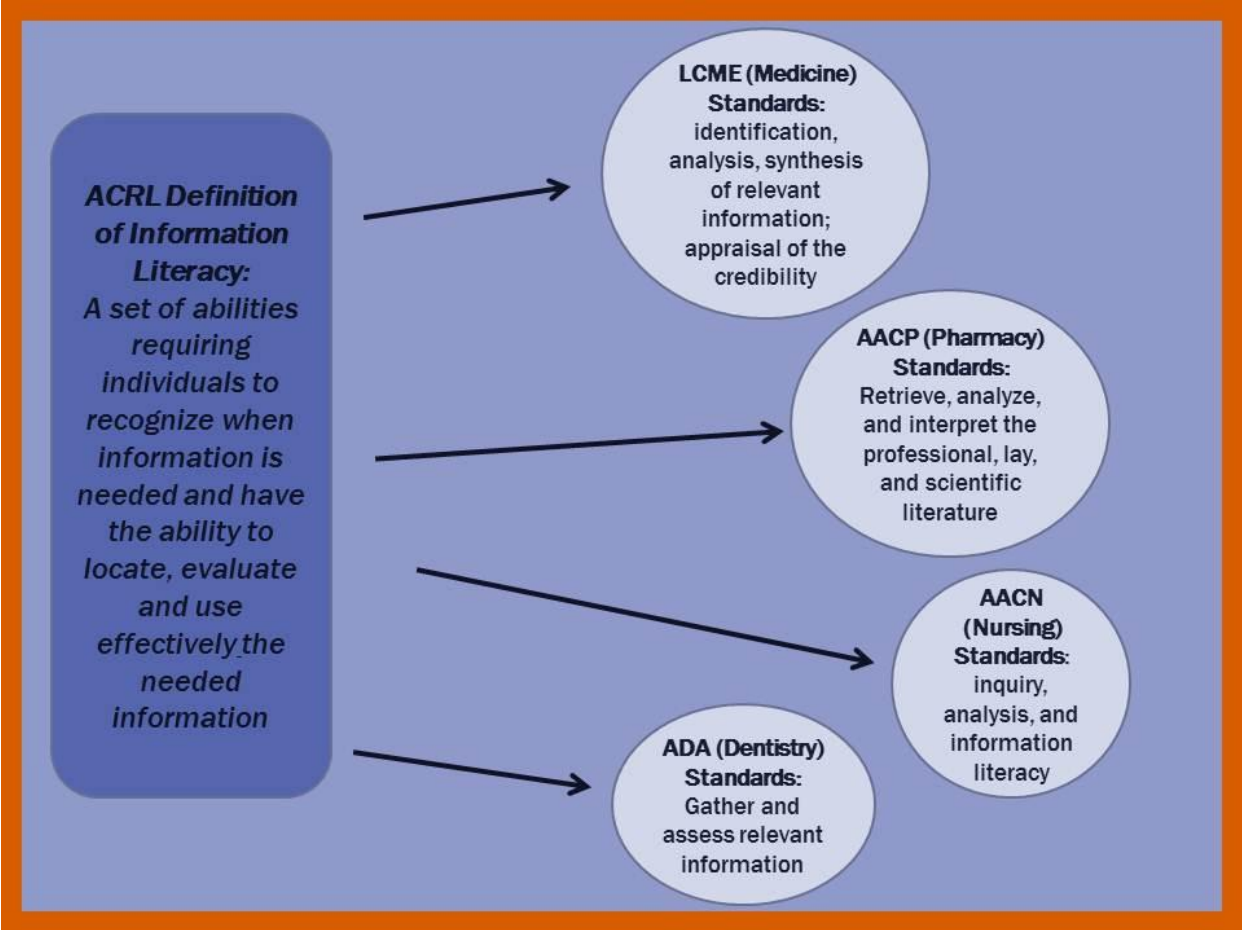Figure 5-1. Kirkpatrick's Evaluation Model

Figure 5-2. Alignment between ACRL's Definition of Information Literacy and Four Health/Medical Accrediting Agencies

APPENDIX A
PRE/POST TEST SELF-EFFICACY AND LIBRARY SKILLS INSTRUMENT

1) I can identify the most appropriate keywords or phrases for the information needed when I search a topic.

    Not Confident (1) Confident (2) Neutral (0) Confident (3) Very Confident (4)

2) I can identify alternate terminology, such as synonym and broader or narrower terms, for the information needed.

    Not Confident (1) Confident (2) Neutral (0) Confident (3) Very Confident (4)

3) I can use a thesaurus in a database to select subject terms for searching.

    Not Confident (1) Confident (2) Neutral (0) Confident (3) Very Confident (4)

4) I can construct a search using Boolean operators (e.g., AND, OR, NOT).

    Not Confident (1) Confident (2) Neutral (0) Confident (3) Very Confident (4)

5) I can use a particular search field (e.g., title, URL, author) when searching for specific information.

    Not Confident (1) Confident (2) Neutral (0) Confident (3) Very Confident (4)

6) I can construct a keyword search so that my search words are found near each other, within the same paragraph of a document.

    Not Confident (1) Confident (2) Neutral (0) Confident (3) Very Confident (4)

7) I can construct a search to retrieve documents containing an exact phrase.

    Not Confident (1) Confident (2) Neutral (0) Confident (3) Very Confident (4)

8) I can construct a complex search using more than one Boolean operator and grouping terms together using parentheses.

    Not Confident (1) Confident (2) Neutral (0) Confident (3) Very Confident (4)

9) I can use truncation symbols (e.g., *, $) to find variants of search words (e.g., teach, teacher, teaching) when searching in a database.
    Not Confident (1) Confident (2) Neutral (0) Confident (3) Very Confident (4)

10) When subject terms relevant to a topic are shown in a database, I can search for additional information using those subject terms.

Not Confident (1) Confident (2) Neutral (0) Confident (3) Very Confident (4)

11) I can narrow or broaden my search to retrieve the appropriate quantity of information.

Not Confident (1) Confident (2) Neutral (0) Confident (3) Very Confident (4)

12) Please use library resources to complete the following searches and enter your results:
A) What years do we have electronic access to this journal: *British Journal of Educational Technology*
B) Database search: Using the most appropriate library database please find an article on blended learning in undergraduate medical education written in the last 2 years. Use the box below to enter the citation for the article and your exact search strategy.
C) Using the library catalog find an electronic book on the topic of blended learning. Use the box below to copy and paste the citation information (title, author, publication date, publication place)

13) Please rate your confidence in completing the searches in question #12

Not Confident (1) Confident (2) Neutral (0) Confident (3) Very Confident (4)

APPENDIX B
OBJECTIVE CITATION RUBRIC SCORING SCALE

Resource	Points	≥ 3 yrs old	≥ 10 years old	Max Points
Dissertations (Published & unpublished)	2	.3	.2	2.5
Theses/pracitcums/action-based research	1	.3	.2	1.5
Periodicals (magazines, trade journals)	0	.3	.2	.5
Scholarly Periodicals	1.5	.3	.2	2.0
Journals	+.3	.3	.2	
Academic/Scholarly	+.2	.3	.2	
Peer-reviewed	+1	.3	.2.	
Books/book chapters (not scholarly)	0	.3	.2	1.5
Books/book chapters (not scholarly)	1	.3	.2	1.5
Books/book chapters (not scholarly)	1	.3	.2	1.5
Reports (gov. agencies, foundations, associations, universities,etc.)	1	.3	.2	1.5
Conference Papers and proceedings (published and unpublished)	1	0	0	1.0
Government laws/legal cases	.5	0	0	.5
ERIC ED documents	0	0	0	0
Newspapers	0	0	0	0
Web sites	0	0	0	0
Miscellaneous	0	0	0	0

Documents that fit two or more categories were included in category with higher weight.

APPENDIX C
SUBJECTIVE RUBRIC SCORING SCALE

ID Number:_____   Rater:_____

Criteria	Level 1 Inadequate	Level 2 Marginally Adequate	Level 3 Adequate	Level 4 Superior
Breadth of Resources - number of citations - variety of resources cited	Student used a limited number and/or variety of resources available on topic or did not show awareness of specialized sources	Limited number and variety of sources cited	Reasonable number and variety of sources used for topic	Exhaustive search that utilizes a comprehensive number and full range of types of sources available for topic
Depth: understanding as demonstrated through the citing of historical, theoretical & background resources	Depth of understanding underdeveloped by a lack of citations from historical, theoretical background resources	Depth of understanding emerging as demonstrated through the citation of a limited number of historical, theoretical, background resources	Depth of understanding developed as demonstrated through the citation of a substantial number of historical, theoretical, background resources	Depth of understanding exemplary as demonstrated through the exhaustive citation of historical, theoretical, background resources
Depth: appropriateness (quality of resource) - primary resources - empirical research - peer-reviewed - seminal/landmark studies	Majority of resources superficial/weak	Limited number of scholarly, peer reviewed, resources/too few empirical research was superficial	Majority of resources were scholarly, peer reviewed and reasonable number of empirical research studies	A rich representation of quality, peer reviewed empirical research/resources very scholarly
Currency: Make no consideration to the availability of resources on the topic being researched	Not current – Majority of references older than 10 years from date of completion	A disproportionate number of unnecessarily dated resources (majority over 5 years)	The majority of resources published 5 years or less from completion of dissertation	Extremely current – majority of references within 5 years of dissertation completion
Relevancy to the topic	Majority of sources do not relate/pertain to the topic	A disproportionate number of sources do not relate/pertain to the topic	Sources generally support/pertain to the topic	Sources directly on target and support/pertain to the topic

OVERALL SCORE_____/20

APPENDIX D
PARTICIPANT REFLECTION QUESTIONS

Students will be asked to respond anonymously to these reflection questions.

1) What role did the librarian (who offered instructional support and assistance) play in your process of completing the annotated bibliography assignment (describing research questions, refining your question, searching for literature, and finally evaluating and synthesizing the literature)?

2) In what ways/How did your prior experiences in clinical research and literature searching influence your completion of the annotated bibliography assignment and use of the embedded librarian support?

APPENDIX E
INSTRUCTOR INTERVIEW QUESTIONS

1. What were the expectations you perceived prior to starting?

2. Expectations of the embedded librarian and the research experiences of the participants?

3. And do you think that's a function of the librarian experience within the course or a function of their professional experience in medicine? What kind of factors may influence that?

4. Did the experience meet your expectations?

5. What are the benefits and concerns for collaborating with a librarian?

6. Were their assignments that would have benefited from a librarian's lecture that didn't have one? What lectures or learning objects would you change or add?

7. Do you perceive that the embedded librarian experience improved the quality of the annotated bibliography assignments? In what ways?

8. Did you discover that students found better resources for their assignments if they watched the lectures and instructional videos?

9. What would you do differently?

10. Final thoughts or comments.

LIST OF REFERENCES

Addoyunlu, B., & Yilmaz-Soylu, M. (2008). Development of a scale on learners' views on blended learning and its implementation process. *Internet and Higher Education, 11*(1), 26-32. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34246f70f65fbf2466f170207470993f1ea46a631234c0f868&fmt=C

Akeroyd, J. (2005). Information management and e-learning: Some perspectives. *Aslib Proceedings, 57*(2), 157-167. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34125f47fcd2b39c66b4a5e11da406c556490ca220f0f10369&fmt=C;

Allegri, F. (1985). Course integrated instruction: Metamorphosis for the twenty-first century. *Medical Reference Services Quarterly, 4*, 47-66. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d340dc26cb7ac65c5cc1de11e49c64bc2d2823fdcccd2ab4beb&fmt=C

Allen, I & Seaman, J. (2010). *Learning on demand: Online education in the united states.* USA: Babson Survey Research Group; The Sloan Consortium.

Allen, I & Seaman, J. (2009). *Learning on Demand: Online Education in the United States.* Babson Park MA: Babson College Survey Research Group. Retrieved February 9, 2010, from www.sloanconsortium.org/publications/survey/pdf/learningondemand.pdf

Alliger, G. M., Janak, E. A. (1989). Kirkpatrick's levels of training criteria: Thirty years later.*Personnel Psychology*, 42 (2), 331-342.

"Guidelines for Distance Learning Library Services," American Library Association, September 01, 2006. http://www.ala.org/ala/mgrps/divs/acrl/standards/guidelinesdistancelearning.cfm (Accessed May 11, 2010). Document ID: 185689

"Information Literacy Competency Standards for Higher Education," American Library Association, September 01, 2006. http://www.ala.org/ala/mgrps/divs/acrl/standards/informationliteracycompetency.cfm (Accessed May 11, 2010). Document ID: 185693

Association of Research Libraries. 2005. Collaboration for distance learning information literacy instruction: A SPEC KIT. Washington, DC: Association of Research Libraries, Office of Leadership and Management Services.

Atlas, M. C., Smigielski, E. M., Wulff, J. L., & Coleman, M. T. (2003). Case studies from morning report: Librarians' role in helping residents find evidence-based clinical information. *Medical Reference Services Quarterly, 22*(3), 1-14. doi:10.1300/J115v22n03_01

Auerbach, J. D., Lonner, B. S., Antonacci, M. D., & Kean, K. E. (2008). Perioperative outcomes and complications related to teaching residents and fellows in scoliosis surgery. *Spine, 33*(10), 1113-1118. doi:10.1097/BRS.0b013e31816f69cfuy766

Badke, W. (2009). Ramping up the one-shot. *Online (Weston, Conn.), 33*(2), 47-49. Retrieved from HTML: http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d3471ce09edbf1de6275d1cb57f369da93f1ae884504ddd03c6&fmt=H PDF: http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d3471ce09edbf1de6275d1cb57f369da93f1ae884504ddd03c6&fmt=P

Bailey-Hainer, B., & Horton, V. (2005). Library support for E-learning in colorado. *Colorado Libraries, 31*(3), 6-9. Retrieved from Full Text HTMLFull Text PDF HTML: http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34125f47fcd2b39c661fa04a4d34e3519d5d6d496dafa4f63a&fmt=H

Baird, C. M., & Wilson, P. (2002). Distance learning librarian: Essential team member in distance learning design. *Journal of Library Administration, 37*(1/2), 49.

Bandura, A.J. (1977). Self-efficacy: *The exercise of control.* New York: Freeman.

Bangert-Drowns, R.L. (1986). Review of developments in meta-analytic methods. *Psychological Bulletin,* 99, 388-399.

Bangert-Drowns, Robert L. & Rudner, Lawrence M. (1991). Meta-analysis in educational research. *Practical Assessment, Research & Evaluation*, 2(8).

Barton, J., German, R., & Joint, N. (2004). Beyond the happy sheets! evaluating learning in information skills teaching. *IATUL Annual Conference Proceedings,14*, 1-1. Retrieved from https://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=15353977&site=ehost-live

Bauerly, R. J., & Johnson, D. T. (2005). An evaluation of journals used in doctoral marketing programs. *Journal of the Academy of Marketing Science, 33*(3), 313-329. doi:10.1177/0092070304272052

Behr, M. D. (2004). On ramp to research: Creation of a multimedia library instruction presentation for off-campus students. *Journal of Library Administration, 41*(1/2), 19-30. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34e9c89366c0a401091664c9e9bda9ab99745fe2b5d570fafa&fmt=C;

Beile, P. (2002). The effect of library instruction learning environments on self-efficacy levels and learning outcomes of graduate students in education., 8.

Beile, P. M. (2003). Effectiveness of course-integrated and repeated library instruction on library skills of education students. *Journal of Educational Media & Library Sciences, 40*(3), 271-277. Retrieved from Full Text HTML Full Text PDF HTML: http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34fbec02af0eab02136119210743b56c24eeebb2570b9148ba&fmt=H PDF: http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34fbec02af0eab02136119210743b56c24eeebb2570b9148ba&fmt=P

Beile, P. M., & Boote, D. N. (2004). Does the medium matter?: A comparison of a web-based tutorial with face-to-face library instruction on education students' self-efficacy levels and learning outcomes. *Research Strategies, 20*(1/2), 57-68. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34e9c89366c0a401097266d4518b5aa893be1f18c31f2304c5&fmt=C; The author of this article has chosen the following Web sites: http://www.acrl.org/ala/acrl/acrlstandards/informationliteracycompetency.htm

Bell, S. J. (2005). Creating community online. *American Libraries, 36*(4), 68-71. Retrieved from Full Text HTMLFull Text PDF HTML: http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34125f47fcd2b39c667a1771a64439795ab50732fc721b9587&fmt=HPDF: http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34125f47fcd2b39c667a1771a64439795ab50732fc721b9587&fmt=P

Bell, S. J., & Shank, J. (2004). The blended librarian: A blueprint for redefining the teaching and learning role of academic librarians. *College & Research Libraries News, 65*(7), 372-375. Retrieved from Full Text HTMLFull Text PDF HTML: http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34e9c89366c0a4010948abdfbdac7899be8a74cf20e2c7c1ac&fmt=HPDF: http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34e9c89366c0a4010948abdfbdac7899be8a74cf20e2c7c1ac&fmt=P;

Bird, J., & Morgan, C. (2003). Adults contemplating university study at a distance: Issues, themes and concerns. *International Review of Research in Open and Distance Learning,* Retrieved from Find it @ UF http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34f09e2d096935499dc58dc3a88675bc56d44485e052db680e&fmt=C

Birdsall, W. F. (2008). The chiasmus of librarianship and collaborative research for evidence based practice. *Evidence Based Library and Information Practice,3*(2), 65-75. Retrieved from Find it @ UF http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34246f70f65fbf2466b0d996a043b232431808c9639c4eb2cc&fmt=C;

Blakeslee, S., & Johnson, K. (2002). Using HorizonLive to deliver library instruction to distance and online students. *Reference Services Review, 30*(4), 324-329.

Bober, C., et al.. (1995). Evaluating library instruction in academic libraries: A critical review of the literature, 1980-1993. *Reference Librarian,* (51-52), 53-71.

Bogel, G. (2008). Facets of practice. *Knowledge Quest, 37*(2), 10-15. Retrieved from Full Text HTMLFull Text PDF HTML:http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34246f70f65fbf246687af4065c857e9b347a25cc77bbdc272&fmt=HPDF:http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34246f70f65fbf246687af4065c857e9b347a25cc77bbdc272&fmt=P

Boote, P. & Beile, D. (2005). Scholars before researchers: On the centrality of the dissertation literature review in research preparation. *Educational Researcher,* 34(6), 3-15.

Bordonaro, K., & Richardson, G. (2004). Scaffolding and reflection in course-integrated library instruction. *The Journal of Academic Librarianship, 30*(5), 391-401. Retrieved from Full Text HTML Full Text PDF HTML: http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34e9c89366c0a4010949f7e2c1fb3346a73250acd624440f68&fmt=H PDF: http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34e9c89366c0a4010949f7e2c1fb3346a73250acd624440f68&fmt=P

Borowski, D. W., Ratcliffe, A. A., Bharathan, B., Gunn, A., Bradburn, D. M., Mills, S. J., . . . Northern Region Colorectal Cancer Audit Group (NORCCAG). (2008). Involvement of surgical trainees in surgery for colorectal cancer and their effect on outcome. *Colorectal Disease : The Official Journal of the Association of Coloproctology of Great Britain and Ireland, 10*(8), 837-845. doi:10.1111/j.1463-1318.2007.01465.x

Bowler, M., & Street, K. (2008). *Investigating the efficacy of embedment: Experiments in information literacy integration* Retrieved from https://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=35937284&site=ehost-live

Bozeman, D., & Owens, R. (2008). Providing services to online students: Embedded librarians and access to resources. *Mississippi Libraries, 72*(3), 57-59. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=34694030&site=ehost-live

Bradley, D. R., Rana, G. K., Lypson, M. L., & Hamstra, S. J. (2010). A centralized practice-based learning and improvement curriculum for residents and fellows: A collaboration of health sciences librarians and graduate medical education administration. *Journal of the Medical Library Association JMLA, 98*(2), 175-178. doi:10.3163/1536-5050.98.2.013

Brazzeal, B., & Fowler, R. (2005). Patterns of information use in graduate research in forestry: A citation analysis of master's theses at mississippi state university. *Science & Technology Libraries, 26*(2), 91-106. doi:10.1300/J122v26n02-05

Brettle, A. (2007). Transforming the profession: Reflections on evidence based library and information practice, 4th international conference. *Evidence Based Library and Information Practice, 2*(2), 123-126. Retrieved from Find it @ UF http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d343b1cd1d482ab0cfacb22ef18a541b68f61883f99df8e0a14&fmt=C; The author of this article has chosen the following Web sites:http://www.eblip4.unc.edu/

Brown, J. F., & Nelson, J. L. (2003). Integration of information literacy into a revised medical school curriculum. *Medical Reference Services Quarterly, 22*(3), 63-74. doi:10.1300/J115v22n03_07

Brown, J.S., Collins, A. & Duguid, S. (1989). Situated cognition and the culture of learning. *Educational Researcher*, 18(1), 32-42.

Bruer, J. T. (1985). Methodological quality and citation frequency of the continuing medical education literature. *Journal of Documentation, 41*, 165-172. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d340dc26cb7ac65c5cc008f217c6a47898a1b6cb9309b7e1ba6&fmt=C

Brunvand, A., & Pashkova-Balkenhol, T. (2008). Undergraduate use of government information: What citation studies tell us about instruction strategies. *Portal: Libraries & the Academy, 8*(2), 197-209. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=31790012&site=ehost-live

Buddy, J. W. (2006). A virtual new start. *School Library Media Activities Monthly, 23*(1), 55-58. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34efc82a53b652dcead348f2d94b8e9e5406a65f5fcd44ed7d&fmt=C

Cain, D. L., & Lockee, B. (2002). Student support services at a distance: Are institutions meeting the needs of distance learners?, 16.

Callison, D. (1997). Evolution of methods to measure student information use. *Library & Information Science Research, 19*(4), 347-357. Retrieved from Find it @ UF http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34c0f2954970d7ad6c636012cfb487544d689b40eb53e5af3f&fmt=C

Carnwell, R., & Harrington, C. (2001). Diagnosing student support needs for distance learning. AIR 2001 annual forum paper, 24.

Casey, D. M. (2008). A journey to legitimacy: The historical development of distance education through technology. *TechTrends: Linking Research and Practice to Improve Learning, 52*(2), 45-51. Retrieved from http://dx.doi.org/10.1007/s11528-008-0135-z

Cassner, M., & Adams, K. E. (2006). Assessing the professional development needs of distance librarians in academic libraries. *Journal of Library Administration, 45*(1/2), 81-99. Retrieved from Find it @ UF http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34efc82a53b652dcea2f3e84f71c240be61781b1a2b6d826d0&fmt=C: The author of this article has chosen the following Web sites:http://www.ala.org/acrl/resjune02.htmlhttp://www.lu.com/odli

Cavanaugh, C., Dawson, K., & Black, E. W. (2010). *Performance narrative.* (Grant Annual Report

Chakraborty, M., & Victor, S. (2004). Do's and don' ts of simultaneous instruction to on-campus and distance students via videoconferencing. *Journal of Library Administration, 41*(1/2), 97-112.

Chaudhuri, N., Grayson, A. D., Grainger, R., Mediratta, N. K., Carr, M. H., Soorae, A. S., & Page, R. D. (2006). Effect of training on patient outcomes following lobectomy. *Thorax, 61*(4), 327-330. doi:10.1136/thx.2005.046847

Chen, K., & Lin, P. (2011). Information literacy in university library user education. *Aslib Proceedings, 63*(4), 399-418. doi:10.1108/00012531111148967

Churkovick, M., Oughtred, C. (2002). Can an Online Tutorial Pass the Test for Library Instruction? An Evaluation and Comparison of Library Skills Instruction Methods for First Year Students at Deakin University. *Australian Academic & Research Libraries*, 33(1), 25-38.

Cipkin, C. (2002). Using a virtual learning environment to integrate information skills into the curriculum: A subject librarian's experiences. *SCONUL NEWSLETTER, *, 7-9.

Clark, J. M. & Paivio, A. (1991). Dual coding theory and education. Educational Psychology Review, 3(3), 149-170.

Clark, R.E. (1983). Reconsidering research on learning from media. *Review of Educational Research, 53*(4), 445-459.

Clark, W., Hernandez, J., McKeon, B. A., Kahn, A., Morton, C., Toomey, P., . . . Rosemurgy, A. (2010). Surgery residency training programmes have greater impact on outcomes after pancreaticoduodenectomy than hospital volume or surgeon frequency. *HPB : The Official Journal of the International Hepato Pancreato Biliary Association, 12*(1), 68-72. doi:10.1111/j.1477-2574.2009.00130.x

Clayton, P. (1995). No easy option: Case study research in libraries. *Australian Academic & Research Libraries, 26*, 69-75. Retrieved from Find it @ UF http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d349180c1451b57511e799b84dc99d879be309c086b93f629d2&fmt=C

Cmor, D., Chan, A., & Kong, T. (2010). Course-integrated learning outcomes for library database searching: Three assessment points on the path of evidence. *Evidence Based Library and Information Practice, 5*(1), 64-81. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34c9aabf518ccc3f8e102d5633b21ed22ccc839ede73a78b4a&fmt=C

Cmor, D., & Marshall, V. (2006). Librarian class attendance: Methods, outcomes and opportunities. *IATUL Annual Conference Proceedings, 16*, 56-61. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=26225970&site=ehost-live

Collins, A., Brown, J. S. and Newman, S. E. (1989). Cognitive apprenticeship: Teaching the crafts of reading, writing, and mathematics. In L.B. Resnick (Ed.), *Knowing, learning and instruction: Essays in honour of Robert Glaser*, Hillsdale, NJ: LEA, pp. 453-494.

Collins, K. M. T., & Veal, R. E. (2004). Off-campus adult learners' levels of library anxiety as a predictor of attitudes toward the internet. *Library & Information Science Research, 26*, 5-14.

Cook, D. L. (2002). Ship to shore: An online information literacy tutorial using BlackBoard distance education software. *Journal of Library Administration, 37*(1/2), 177.

Cook, S. (2009). Important Events in the Development of Academic Advising in the United States. *NACADA Journal, 29*(2), 18-40.

Cornelius, S., & Gordon, C. (2008). Providing a flexible, learner-centred programme: Challenges for educators. *Internet and Higher Education, 11*(1), 33-41. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34246f70f65fbf2466f170207470993f1eb0793b21a0800322&fmt=C;

Craven, C. K., Goode, V., Twose, C., Zhang, D., & Roderer, N. K. (2010). WelServe: The DBMS for capturing and tracking welch medical library's embedded informationist service delivery at johns hopkins medical institutions. *Journal of Library Administration, 50*(4), 397-411. doi:10.1080/01930821003667112

Dare, L. A., Zapata, L. P., & Thomas, A. G. (2005). Assessing the needs of distance learners: A student affairs perspective. *New Directions for Student Services,* (112), 39-54. Retrieved from http://dx.doi.org/10.1002/ss.183

Davis, E. (2005). Virtual research and the online school. *Colorado Libraries, 31*(3), 14. Retrieved from Full Text HTMLFull Text PDF HTML: http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34125f47fcd2b39c661fa04a4d34e3519d8dc9a8253aaa9ba7&fmt=H

De Groote, S. L. (2008). Citation patterns of online and print journals in the digital age. *Journal of the Medical Library Association, 96*(4), 362-369. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=35974523&site=ehost-live

Dewey, B. I. (2004). The embedded librarian: Strategic campus collaborations. *Resource Sharing & Information Networks, 17*(1), 5-17. doi:10.1300/J121v17n01_02

Distance education and training council: The global leader in distance learning accreditation Retrieved 11/18/2011, 2011, from http://www.detc.org/

Dharmadhikari, V. (2007). Education for capacity building: New strategies to include ICT. *Information Studies, 13*(3), 131-138.

Dorsch, J. L., Jacobson, S., & Scherrer, C. S. (2003). Teaching EBM teachers: A team approach. *Medical Reference Services Quarterly, 22*(2), 107-114. doi:10.1300/J115v22n02_10

Doyle, B. (2006). Crossing the digital divide. *EContent, 29*(7), 36.

Drori, O. (2003). Finding a paper's subject based on cited and citing papers. *Journal of Information Science, 29*(6), 537-540. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=12033906&site=ehost-live

Duffy, T.M. and Kirkley, J.R. (2004). *Learner Centered theory and practice in distance education: cases from higher education*. London: Lawrence Erlbaum Associates.

Dugan, M. (2008). Embedded librarians in an ag econ class: Transcending the traditional. *Journal of Agricultural & Food Information, 9*(4), 301-309. doi:10.1080/10496500802480342

Dunlap, S. (2002). "Watch for the Little Red Light: Delivery of Bibliographic Instruction by Unconventional Means." In The Tenth Off-Campus Library Services Conference Proceedings: Cincinnati, Ohio, April 17-19, 2002, edited by Patrick B. Mahoney. Mount Pleasant, MI: Central Michigan University, 2002, 221-225. Reprinted in *Journal of Library Administration* 37(1/2), 279-285.

Eckel, E. J. (2009). The emerging engineering scholar: A citation analysis of theses and dissertations at western michigan university. *Issues in Science & Technology Librarianship,* (56), 5-5. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=44059094&site=ehost-live

Edwards, M. Kumar, S. Ochoa, M. (2010). Assessing the Value of Onine Embedded Librarians. *Public Services Quarterly*. 6(2/3) June 2010.

Edzan, N. N. (2008). Analysing the references of final year project reports. *Journal of Educational Media & Library Sciences, 46*(2), 211-231. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=37131377&site=ehost-live

Ferree, N., Schaefer, N., Butson, L. C., & Tennant, M. R. (2009). Liaison librarian tiers: Levels of service. *Journal of the Medical Library Association: JMLA, 97*(2), 145.

Ferguson, K. S., & Ferguson, A. (2005). The remote library and point-of-need user education: An australian academic library perspective. *Journal of Interlibrary Loan, Document Delivery & Information Supply, 15*(3), 43-60. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34125f47fcd2b39c66f9628619bc7a5f8e6b6ba412a882f675&fmt=C;

Finkelstein, J. (2006). *Learning in real time: synchronous teaching and learning online*. San Francisco, CA: Jossey-Bass.

Fisher, M., & Baird, D. E. (2005). Online learning design that fosters student support, self-regulation, and retention. *Campus-Wide Information Systems, 22*(2), 88-107. Retrieved from http://dx.doi.org/10.1108/10650740510587100; http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34f09e2d096935499d67ddaa9c1c1be22ebede34624821f966&fmt=C

Fletcher, K. M. (2005). Self-efficacy as an evaluation measure for programs in support of online learning literacies for undergraduates. *Internet and Higher Education, 8*(4), 307-322. Retrieved from The author of this article has chosen the following Web sites:http://www.apa.org/monitor/oct04/gifts.htmlhttp://www.abds.gov.au/ausstatshttp://it.coe.uga.edu/itformm/paper75/paper75.html;http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34125f47fcd2b39c6645da4eb0c202cd2ddb3557b50fcc464d&fmt=C

Foote, M. (2001). Research & librarianship. *North Carolina Libraries, 59*(1), 4-25. Retrieved from Full Text PDF PDF:http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d3475285a693210cd5738676e161151d72a033d4fa7917bec47&fmt=P

Forte, E., & DeDecker, S. (2005). Distance government publications instruction to library school students: Lessons learned. *DttP, 33*(1), 28-31.

Foster, F. & Gibbons, S. (Eds.). (2007). Studying Students. Chicago: Association of College and Research Libraries.

Fourie, I. (2001). Using a variety of methods of distance teaching methods to teach online search skills to working adults. *National Online 2001 Proceedings, *, 139-156.

Freiburger, G., & Kramer, S. (2009). Embedded librarians: One library's model for decentralized service. *Journal of the Medical Library Association, 97*(2), 139-142. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=40097809&site=ehost-live

Fritts, J., & Casey, A. M. (2010). Who trains distance librarians? A study of the training and development needs of distance learning librarians. *Journal of Library Administration, 50*(5/6), 617-627. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34c9aabf518ccc3f8e541209cf6ab81d147eb260a68996db0e&fmt=C

Gandhi, S. (2003). Academic librarians and distance education challenges and opportunities. *Reference and User Services Quarterly, 43*(2), 138-154.

Gao, S., Yu, W., & Luo, F. (2009). Citation analysis of PhD thesis at wuhan university, china. *Library Collections, Acquisitions, & Technical Services, 33*(1), 8-16. doi:10.1016/j.lcats.2009.03.001

Garnsey, M. R. (2002). What distance learners should know about information retrieval on the world wide web. *Distance Learning: Information Access and Services for Virtual Users, 37*(77), 19.

Garrison, D. R., & Shale, D. (1987). Mapping the boundaries of distance education: Problems in defining the field. *American Journal of Distance Education, 1*(1), 7-13.

Garrison, D. R., Anderson, T., & Archer, W. (1999). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education, 2*(2-3), 87-105.

Garrison, D. R., Anderson, T., & Archer, W. (2001). Critical thinking and computer conferencing: A model and tool to assess cognitive presence.

Garrison, D. R., Anderson, T., & Archer, W. (2001). Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of Distance Education, 15*(1), 7-23.

Gibbons, S. (2005). Course-management systems. *Library Technology Reports, 41*(3), 7-11. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=17297353&site=ehost-live

Glaser, B. G & Strauss, A. L. (1967). The Discovery of Grounded Theory: Strategies for Qualitative Research, Chicago, Aldine Publishing Company

Glass, G.V, McGaw, B., & M.L. Smith (1981). *Meta-analysis in social research*. Beverly Hills, CA: Sage.

Glynn, L. (2008). Evidence based practice outside the box. *Evidence Based Library and Information Practice, 3*(3), 1-2. Retrieved from Find it @ UFhttp://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34246f70f65fbf2466f34c7f30b68572dd10d7bd1ff5ca200c&fmt=C

Gooch, J. (1998). They blazed a trail for distance education. Retrieved Februaruy 3rd, 2011, from http://www.uwex.edu/disted/gooch.cfm

Grover, R. (1994). Assessing information skills instruction. *Reference Librarian,* (44), 173-189.

Grassian, E. S., & Kaplowitz, J. R. (2001). *Information literacy instruction: Theory and practice. information literacy sourcebooks.* Neal-Schuman Publishers, Inc., 100 Newfield Ave., Edison, NJ 08837 ($55). Tel: 866-672-6657 (Toll Free); Fax: 866-209-7932 (Toll Free); e-mail: orders@neal-schuman.com; Web site: http://www.neal-schuman.com. Retrieved from No

Hampel, R. (2003). Theoretical perspectives and new practices in audio-graphic conferencing for language learning. *ReCALL*, 15(1), 21-36.

Hampel, R. (2006). Rethinking task design for the digital age: a framework for language teaching and learning in a synchronous online environment. *ReCALL*, 18(1), 105-121.

Hannelore B. Rader. (2000). Library instruction and information literacy – 1999. *Reference Services Review, 28*(4), 378.

Haricharan, R. N., Aprahamian, C. J., Celik, A., Harmon, C. M., Georgeson, K. E., & Barnhart, D. C. (2008). Laparoscopic pyloromyotomy: Effect of resident training on complications. *Journal of Pediatric Surgery, 43*(1), 97-101. doi:10.1016/j.jpedsurg.2007.09.028

Haynes, A. (2002). Distance learning library services: Challenges and opportunities for an academic library system.

Helliwell, M. (2007). Reflections of a practitioner in an evidence based world: 4th international evidence based library & information practice conference.*Evidence Based Library and Information Practice, 2*(2), 120-122. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d343b1cd1d482ab0cfacb22ef18a541b68fadd86e55513af743&fmt=C

Henner, T. (2002). "Bridging the Distance: Bibliographic Instruction for Remote Library Users." *Medical Reference Services Quarterly* 21(1), 79-85.

Herther, N. K. (2009). Research evaluation and citation analysis: Key issues and implications. *Electronic Library, 27*(3), 361-375. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=43810907&site=ehost-live

Hirose, Y., & Nakazawa, N. (2007). Special feature: Evaluation methods in library and information activities. methods of journal collection assessment using journal citation data. *Journal of Information Science & Technology Association/Joho no Kagaku to Gijutsu, 57*(8), 396-403. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=31970433&site=ehost-live

Hoffert, S. P., *1997. Meta-Analysis Gaining Status In Science And Policymaking. The Scientist*, Vol. 11, n.18, p. 1,5

Hricko, M. (2002). Using the invisible web to teach information literacy. *Journal of Library Administration, 37*(3/4), 379.

Hunter, J.E., & F.L. Schmidt (1990). *Methods of meta-analysis*. Newbury Park, CA: Sage.

Hurst, S., & Leonard, J. (2007). Garbage in, garbage out: The effect of library instruction on the quality of students' term papers. *E-JASL: The Electronic Journal of Academic and Special Librarianship,* Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d343b1cd1d482ab0cfae7db56fc517fa7cb4204626e9016b971&fmt=C

Jayne, E. A. (2000). The librarian as bricoleur: Meeting the needs of distance learners. *Reference Services for the Adult Learner: Challenging Issues for the Traditional and Technological Era,* , 161.

Jiao, Q. G., Onwuegbuzie, A. J., & Waytowich, V. L. (2008). The relationship between citation errors and library anxiety: An empirical study of doctoral students in education. *Information Processing & Management, 44*(2), 948-956. doi:10.1016/j.ipm.2007.05.007

Johnson, W. G. (2008). Educational technology and college librarianship. *College & Undergraduate Libraries, 15*(4), 463-475. Retrieved from Find it @ UFhttp://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34246f70f65fbf2466df4069b4b7e5772520036889ebcb3524&fmt=C; The author of this article has chosen the following Web sites:http://aect.org/About/Historyhttp://aect.org/About/Ethics.asphttp://ala.org/ala/acrl/acrlstandards/informationliteracycompetency.htm

Jones, M. F. (2003). Help! I'm the new distance LibrarianWhere do I begin? *Journal of Library Administration, 37*(3/4), 397-410. Retrieved from Find it @ UFhttp://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34fbec02af0eab021351732b2abd668b6f9cbe3c7ed294f719&fmt=C; The author of this article has chosen the following Web sites:http://caspian.switchinc.org/-distlearn/

Kappus, T., & Jenks, K. (2008). Traveling the information goat trail: Serving the very distant, the involuntarily clueless and the self-described techno-peasant. *PNLA Quarterly, 73*(1), 5-9.

Kearley, J. & Phillips, L. (2004). Embedding library reference services in online courses. *Improving Internet Reference Services to Distance Learners*, 9(1/2), 65-76.

Kelly, R. (2001). An integrated approach to student services. *Distance Education Report, 5*(6), 5. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34f09e2d096935499dc1407572df1537369edfc42505249224&fmt=C

Kesselman, M. A., & Watstein, S. B. (2009). Creating opportunities: Embedded librarians. *Journal of Library Administration, 49*(4), 383-400. doi:10.1080/01930820902832538

Kinder, R. (2002). Instructional services for distance education. *Distance Learning: Information Access and Services for Virtual Users, 37*(77), 63.

Klem, M. L., & Weiss, P. M. (2005). Evidence-based resources and the role of librarians in developing evidence-based practice curricula. *Journal of Professional Nursing : Official Journal of the American Association of Colleges of Nursing, 21*(6), 380-387. doi:10.1016/j.profnurs.2005.10.004

Kirkpatrick D. L. (1959). Techniques for evaluating training programs. "Journal of American Society of Training Directors", 13 (3): pp. 21 - 26.

Kronenfeld, M., Stephenson, P. L., Nail-Chiwetalu, B., Tweed, E. M., Sauers, E. L., McLeod, T. C., . . . Ratner, N. B. (2007). Review for librarians of evidence-based practice in nursing and the allied health professions in the united states. *Journal of the Medical Library Association : JMLA, 95*(4), 394-407. doi:10.3163/1536-5050.95.4.394

Kuhlthau, C. C. (1988). Developing a model of the library search process: Cognitive and affective aspects. *Reference Quarterly, 28*(2), 232-242.

Kuhlthau, C. C. (1991). Inside the search process: Information seeking from the user's perspective. *Journal of the American Society for Information Science, 42*(5), 361-371.

Kulik, J.A., & C.-L.C. Kulik (1989). Meta-analysis in education. *International Journal of Educational Research*, 13, 221-340.

Kurbanoglu, S. S. (2003). Self-efficacy: A concept closely linked to information literacy and lifelong learning. *Journal of Documentation, 59*(6), 635-646. Retrieved from The author of this article has chosen the following Web sites:http://www.ala.org/aas/positions/PS_infolit.htmlhttp://www.ala.org/acrl/ilstandardlo.htmlhttp://graduateresearch.com/Kear.htm;http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34fbec02af0eab021343ff73498afa938697c34fb450488671&fmt=C

Kurbanoglu, S. S., Akkoyunlu, B., & Umay, A. (2006). Developing the information literacy self-efficacy scale. *Journal of Documentation, 62*(6), 730-743.

Kontos, F., & Henkel, H. (2008). Live instruction for distance students: Development of synchronous online workshops. *Public Services Quarterly, 4*(1), 1-14. doi:10.1080/15228950802135657

Koufogiannakis, D., & Crumley, E. (2003). Facilitating evidence-based librarianship: A Canadian experience. *Health Information and Libraries Journal, 20 Suppl 1*, 73-75.

Kozma, R.B. (1991). Learning with media. *Review of Educational Research, 61*(2), 179-211.

Kumar, K., & Sharma, J. (2007). E-learning: The learner - centred education for LIS professionals. *Journal of Library & Information Science, 32*(1), 1-16. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=28156675&site=ehost-live

Lillard, L. L., Norwood, S., Wise, K., Brooks, J., & Kitts, R. (2009). Embedded librarians: MLS students as apprentice librarians in online courses. *Journal of Library Administration, 49*(1), 11-22. doi:10.1080/01930820802310544

Lin, Y. Y., Shabbir, A., & So, J. B. (2010). Laparoscopic appendectomy by residents: Evaluating outcomes and learning curve. *Surgical Endoscopy, 24*(1), 125-130. doi:10.1007/s00464-009-0691-0

Lindsay, E. B., Cummings, L., & Johnson, C. M. (2006). If you build it, will they learn? assessing online information literacy tutorials. *College & Research Libraries, 67*(5), 429-445. Retrieved from HTML: http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34efc82a53b652dcea0637c07791019fe68cc3b625b9b0106c&fmt=HPDF:http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34efc82a53b652dcea0637c07791019fe68cc3b625b9b0106c&fmt=P

Locatis, C., Gaines, C., & Liu Wei-Li. (2006). A blended training approach using videoconferencing for distance education. *Journal of the Medical Library Association, 94*(4), 464-468. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34efc82a53b652dcea614d58bcea74efb6db5fff0d4368ede9&fmt=C

Loertscher, D. V. (2009). Evidence-based practice: Evolution or revolution? *Evidence Based Library and Information Practice, 4*(2), 178-181. Retrieved from Find it @ UF

Love, M., & Norwood, S. (2007). Finding our way as "embedded librarians". *College & Undergraduate Libraries, 14*(4), 87-93. doi:10.1080/10691310802128369

Ludwig-Hardman, S., & Dunlap, J. C. (2003). Learner support services for online students: Scaffolding for success. *International Review of Research in Open and Distance Learning,* Retrieved from Find it @ UF http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34f09e2d096935499dc58dc3a88675bc56b4d257f7a693435f&fmt=C

Lyons, R. (2009). The call for evidence based practice: Speaking louder than words. *Evidence Based Library and Information Practice, 4*(3), 63-67. Retrieved from Find it @ UF http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d3471ce09edbf1de627fa456678d103ea68f6804ca49fa7c575&fmt=C;

MacDonald, D. (1998) Audio *and audiographic learning: the cornerstone of the information highway*. Montreal: Cheneliere-McGraw-hill.

Machen. B. "State of the University". University of Florida. J. Reitz Union, Gainesville, FL. 26 August 2010, Faculty Senate Meeting http://www.president.ufl.edu/state-of-university/docs/State-of-the-University-2010.pdf

Main, L. (1998). WOOing the millennium. *Journal of Education for Library & Information Science, 39*(4), 339. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=1485550&site=ehost-live

Maki, P. L. (2001). From standardized tests to alternative methods: Some current resources on methods to assess learning in general education. *Change*, 33(2), 28-31.

Malikowski, S. R., Thompson, M. e., & Theis, J. G. (2006). External factors associated with adopting a CMS in resident college courses. *Internet and Higher Education, 9*(3), 163-174. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34efc82a53b652dcea97126ceb95308856db2908d9a2e432a2&fmt=C;

Manus, S. J. B. (2009). Librarian in the classroom: An embedded approach to music information literacy for first-year undergraduates. *Notes, 66*(2), 249-261. Retrieved from https://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=45177684&site=ehost-live

Marinara, M., Vajravelu, K., & Young, D. L. (2004). Making sense of the "loose baggy monster": Assessing learning in a general education program is a whale of a task. *Journal of General Education*, 53(1), 1-19.

Markgraf, J. S. (2004). Librarian participation in the online classroom. *Internet Reference Services Quarterly, 9*(1/2), 5-19.

Matthew, V., & Schroeder, A. (2006). The embedded librarian program. *EDUCAUSE Quarterly, 29*(4), 61-65.

Mayer, R. E. (1997). Multimedia learning: Are we asking the right questions? *Educational Psychologist, 32*(1), 1-19.

Mayer, R. E. (2005). Cognitive theory of multimedia learning. *The Cambridge Handbook of Multimedia Learning,* , 31-48.

Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2009). *Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies.*US Department of Education. Available from: ED Pubs. P.O. Box 1398, Jessup, MD 20794-1398. Tel: 877-433-7827; Fax: 301-470-1244; Web site: http://www.edpubs.org. Retrieved from ERIC

Mellon, C. A. (1984). Process not product in course-integrated instruction: A generic model of library research. *College and Research Libraries, 45*(6), 471-478.

Mellon, C. A. (1986). Library anxiety: A grounded theory and its development. *College & Research Libraries, 47*(2), 160-165.

Mellon, C. A. (1988). Attitudes: The forgotten dimension in library instruction. *Library Journal, 113*(14), 137-139.

McBrien, J. L., Jones, P., & Cheng, R. (2009). Virtual spaces: Employing a synchronous online classroom to facilitate student engagement in online learning. *International Review of Research in Open and Distance Learning,*

McCarthy, L. H. (1996). Evidence-based medicine: An opportunity for health sciences librarians. *Medical Reference Services Quarterly, 15*(4), 63-71. doi:10.1300/J115V15N04_06

McEvoy, G. M., & Cascio, W. F. (1987). Do good or poor performers leave? A meta-analysis of the relationship between performance and turnover. *Academy of Management Journal,* , 744-762.

McGowan, J., Straus, S. E., & Tugwell, P. (2006). Canada urgently needs a national network of libraries to access evidence. *Healthcare Quarterly (Toronto, Ont.), 9*(1), 72-4, 4.

McKee, N. P. (2010). A multifaceted approach to the assessment and evaluation of learning commons services and resources. *College & Undergraduate Libraries, 17*(2), 297-309. doi:10.1080/10691316.2010.490198

McLean, E., & Dew, S. H. (2006). Providing library instruction to distance learning students in the 21st century: Meeting the current and changing needs of a diverse community. *Journal of Library Administration, 45*(3/4), 315-337. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34efc82a53b652dcea140bb142584f1095fc87e2972b700163&fmt=C;

Mirijamdotter, A. (2010). Toward collaborative evidence based information practices: Organisation and leadership essentials. *Evidence Based Library and Information Practice, 5*(1), 17-25. Retrieved from Find it @ UF http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34c9aabf518ccc3f8e102d5633b21ed22c688634801a7ff04a&fmt=C

Monoi, S., O'Hanlon, N., & Diaz, K. R. (2005). Online searching skills: Development of an inventory to assess self-efficacy. *The Journal of Academic Librarianship,31*(2), 98-105. Retrieved from Full Text HTMLFull Text PDF HTML: http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34125f47fcd2b39c666590da08d53072c6fb6c5cc633d00def&fmt=HPDF:http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34125f47fcd2b39c666590da08d53072c6fb6c5cc633d00def&fmt=P

Moore, M. G. (1989). Three types of interactions. *American Journal of Distance Education*, 3(2), 1-6.

Moore, M.G. (1993). Theory of transactional distance. In D. Keegan (Ed.), *Theoretical principles of distance education* (pp. 22-38). New York: Routledge.

Moore, M. and Kearsley, G. (2006). *Distance education: A systems view*. New York: Wadsworth Publishing.

Moore, M., Lockee, B., & Burton, J. (2002). Measuring success: Evaluation strategies for distance education. *Educause Quarterly, 25*(1), 20-26.

Morrison, G. R., Kemp, J. E., & Ross, S. M. (2006). *Designing Effective Instruction.* Hoboken, NJ: J. Wiley & Sons.

Mulvaney, S. A., Bickman, L., Giuse, N. B., Lambert, E. W., Sathe, N. A., & Jerome, R. N. (2008). A randomized effectiveness trial of a clinical informatics consult service: Impact on evidence-based decision-making and knowledge implementation. *Journal of the American Medical Informatics Association : JAMIA, 15*(2), 203-211. doi:10.1197/jamia.M2461

Neely, T. Y. (2000). *Aspects of Information Literacy: A Sociological and Psychological Study.*

Neuhaus, C., & Daniel, H. (2008). Data sources for performing citation analysis: An overview. *Journal of Documentation, 64*(2), 193-210. doi:10.1108/00220410810858010

Nobisso, J. (2008). (Evidence-based) practice makes perfect. *Knowledge Quest, 37*(2), 70-73. Retrieved from Full Text HTMLFull Text PDF HTML:http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34246f70f65fbf246687af4065c857e9b30cf5840076699149&fmt=HPDF:http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34246f70f65fbf246687af4065c857e9b30cf5840076699149&fmt=P

Olatokun, W. M. (2009). Citation analysis of doctoral works submitted to the department of animal science, university of ibadan, nigeria. *Library Philosophy & Practice, 11*(2), 1-15. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=47776528&site=ehost-live

Onwuegbuzie, A. J. (1997b). Writing a research proposal: The role of library anxiety, statistics anxiety, and composition anxiety. Library and Information Science Research, 19, 5–33.

Oo, A. Y., Grayson, A. D., & Rashid, A. (2004). Effect of training on outcomes following coronary artery bypass graft surgery. *European Journal of Cardio-Thoracic Surgery : Official Journal of the European Association for Cardio-Thoracic Surgery, 25*(4), 591-596. doi:10.1016/j.ejcts.2003.12.012

Orme, W. A. (2004). A Study of the residual impact of the Texas information literacy tutorial on the information-seeking ability of first year college students. *College and Research Libraries*, 65(3), 205-215.

Ory, J. C. (1992). Meta-assessment: Evaluating assessment activities. *Research in Higher Education, 33*(4), 467-481.

Osman, G., & Herring, S. C. (2007). Interaction, facilitation, and deep learning in cross-cultural chat: A case study. *Internet & Higher Education, 10*(2), 125-141. doi:10.1016/j.iheduc.2007.03.004

Pace, A. K. (2001). Distance learning service: It's closer than you think. *Computers in Libraries, 21*(4), 49-51.

Paivio, A. (1971). Imagery and Verbal Processes. New York: Holt, Rinehart & Winston.

Paivio, A. (1986). Mental Representations. New York: Oxford University Press.

Pajares, F. (2006). Self-efficacy information. Retrieved 01/24/2011, from
www.des.emory.edu/mfp/self-efficacy.htm

Paris, M. (1988). Thoughts on the case study. *Journal of Education for Library and Information Science, 29*, 137-139. Retrieved from Find it @ UF http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34ddf9242c1b6f55c570cf938c17f1ce31403070d86e679397&fmt=C

Patton, M. Q., & Patton, M. Q. (2002). *Qualitative research and evaluation methods*. Thousand Oaks, Calif: Sage Publications.

Perrone, V., & Perrone, V. (2000). The changing role of librarians and the online learning environment, 2000. *Distance Education: An Open Question,*

Pival, P. R., & Tunon, J. (2001). Innovative methods for providing instruction to distance students using technology. *Journal of Library Administration, 32*(1), 347. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=5088134&site=ehost-live

Pollack, M. (2005). Class dismissed. (cover story). *Library Journal, 130*, 2-6. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=18576231&site=ehost-live

Powell, R. R. (1997). *Basic research methods for librarians*. Greenwich, Conn: Ablex.

Purpur, Geraldine; Ocha, Louise. "New frontiers for distance learning library services : a virtual world library at Appalachian State University." In Bell, Lori, Trueman, Rhonda B. (Eds). Virtual worlds, real libraries : librarians and educators in Second Life and other multi-user virtual environments. Medford, N.J. : Information Today, c2008.

Rama, K., Ed., & Hope, A., Ed. (2009). Quality assurance toolkit for distance higher education institutions and programmes. In (pp. 371) Commonwealth of Learning.

Ramsay, K. M. & Kinne, J. (2006). The Embedded Librarian. *Library Journal, 131*(6), 34-45.

Rader, T., & Gagnon, A. J. (2000). Expediting the transfer of evidence into practice: Building clinical partnerships. *Bulletin of the Medical Library Association, 88*(3), 247-250.

Reeves, L. A. (2005). Trying it on for size: Piloting synchronous online reference service with elluminate vClass. *Internet Reference Services Quarterly, 10*(2), 19-33. doi:10.1300/J136v10n02•03

Rempel, H. G., & McMillen, P. S. (2008). Using courseware discussion boards to engage graduate students in online library workshops. *Internet Reference Services Quarterly, 13*(4), 363-380. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34246f70f65fbf2466d4d3f8dff5abdc7a7f2bc1b2aed9abd4&fmt=C;

Ren, W. (2000). Library instruction and college student self-efficacy in electronic information searching. *The Journal of Academic Librarianship, 26*(5), 323-328. Retrieved from Full Text HTML HTML: http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d3428a64628d64647f48a6cf28b47375e55cc8d43c5c27ff5b9&fmt=H

Rourke, L., Anderson, T., Garrison, D. R., & Archer, W. (1999). Assessing social presence in asynchronous text-based computer conferencing. *Journal of Distance Education, 14*(2), 50-71.

Rudin, P. (2008). No fixed address: The evolution of outreach library services on university campuses. *Reference Librarian, 49*(1), 55-75. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=33007447&site=ehost-live

Russell, T.L. (1999). *The no significant difference phenomenon as reported in 355 research reports, summaries and papers: A comparative research annotated bibliography on technology for distance education*. North Carolina State University: Office of Instructional Telecommunications.

Sacchanand, C., & Jaroenpuntaruk, V. (2006). Development of a web-based self-training package for information retrieval using the distance education approach. *The Electronic Library, 24*(4), 501-516. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34efc82a53b652dcea6f0d15f0bd2338abbc84d1531db624c3&fmt=C;

Sam, J., & Tackie, S. N. B. (2007). Citation analysis of dissertations at the department of information studies, university of ghana, legon. *African Journal of Library, Archives & Information Science, 17*(2), 123-132. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=27245781&site=ehost-live

Searing, S. E. (2004). All in the family: Library services for LIS online education. *Journal of Library Administration, 41*(3/4), 391-405. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34e9c89366c0a40109d1ef59f132f7f0ddda2b36119f72f1aa&fmt=C;

Seliger, H & Shohamy, E. (1989). Second Language Research Methods. Oxford: Oxford University Press.

Scales, B. J., & Lindsay, E. B. (2005). Qualitative assessment of student attitudes toward information literacy. *Portal: Libraries & the Academy, 5*(4), 513-526.

Schlosser, C. A., & Anderson, M. L. (1994). *Distance education: Review of the literature.* AECT Publication Sales, 1025 Vermont Ave., NW, Ste. 820, Washington, DC 20005-3547.

Schullo, S., Venable, M., Barron, A. E., Kromrey, J. D., Hilbelink, A. & Hohlfeld, T. (2005). *Enhancing online courses with synchronous software: an analysis of strategies and interactions*. Paper presented at the National Educational Computing Conference, June 27-30. Philadelphia, PA.

Shank, J. D. (2006). The blended librarian: A job announcement analysis of the newly emerging position of instructional design librarian. *College & Research Libraries, 67*(6), 515-524.

Shank, J. The blended librarian. (2005). *Library Journal (1976), 130*(5), 19. Retrieved from Full Text HTMLFull Text PDF
HTML: http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34125f47fcd2b39c66e29c8be7f05e4c58d471206fd76da626&fmt=HPDF: http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34125f47fcd2b39c66e29c8be7f05e4c58d471206fd76da626&fmt=P

Sherriff, G. (2010). Information use in history research: A citation analysis of master's level theses. *Portal: Libraries & the Academy, 10*(2), 165-183. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=49713464&site=ehost-live

Shumaker, D., & Talley, M. (2009). Models of embedded librarianship: Final report. *Special Libraries Association.Http://www.Sla.org/pdfs/EmbeddedLibrarianshipFinalRptRev.Pdf, 9*

Simpson, O. (2002). Supporting students in online, open and distance learning. second edition. open and distance learning series. In (pp. 226)

Sinclair, B. (2009). The blended librarian in the learning commons: New skills for the blended library. *College & Research Libraries News, 70*(9), 504-7, 516.

Smyth, J. B. (2001). Using a web-based MOO for library instruction in distance education. *Journal of Library Administration, 32*(1), 383. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=5088138&site=ehost-live

Sochrin, S. (2004). "Learning to Teach in a New Medium: Adapting Library Instruction to a Videoconferencing Environment." In <u>The Eleventh Off-Campus Library Services Conference Proceedings: Scottsdale, Arizona, May 5 -7, 2004</u>, edited by Patrick B. Mahoney. Mount Pleasant, MI: Central Michigan University, 2004, 321-330. Reprinted in *Journal of Library Administration* 41(3/4), 429-442**.**

Stein, L. L., & Lamb, J. M. (1998). Not just another BI: Faculty-librarian collaboration to guide students through the research process. *Research Strategies, 16*(1), 29-39. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d3472869cb64e954b912424200bd8f9b540909cd95ceada725e&fmt=C

Stewart, V. D. (2007). Embedded in the blackboard jungle: The embedded librarian program at pulaski technical college. *Arkansas Libraries, 64*(3), 29-32. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=27247367&site=ehost-live

Sun, Y. (2007). Special feature: Evaluation methods in library and information activities. bibliometrics and its applications as a research evaluation tool. *Journal of Information Science & Technology Association/Joho no Kagaku to Gijutsu, 57*(8), 372-377. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=31970429&site=ehost-live

Tait, A. (2000). Planning student support for open and distance learning. *Open Learning, 15*(3), 287-299. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34f09e2d096935499d2df4a47ea9fcc481468b56ad509003eb&fmt=C

Tait, A., Ed., & Mills, R., Ed. (2003). Rethinking learner support in distance education: Change and continuity in an international context. RoutledgeFalmer studies in distance education. In (pp. 218)

Tennant, M. R., Butson, L. C., Rezeau, M. E., Tucker, P. J., Boyle, M. E., & Clayton, G. (2001). Customizing for clients: Developing a library liaison program from need to plan. *Bulletin of the Medical Library Association, 89*(1), 8.

Tennant, M. R., Cataldo, T. T., Sherwill-Navarro, P., & Jesano, R. (2006). Evaluation of a liaison librarian program: Client and liaison perspectives. *Journal of the Medical Library Association, 94*(4), 402.

Tennant, M. R., & Miyamoto, M. M. (2002). The role of medical libraries in undergraduate education: A case study in genetics. *Journal of the Medical Library Association, 90*(2), 181.

Thomas, J. (2000). Never enough: Graduate student use of journals-- citation analysis of social work theses. *Behavioral & Social Sciences Librarian, 19*(1), 1. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=lxh&AN=27706867&site=ehost-live

Thompson, G. B. (2002). Information literacy accreditation mandates: What they mean for faculty and librarians. *Library Trends, 51*(2), 218-241.

Thorpe, M. (2002). Rethinking learner support: The challenge of collaborative online learning. *Open Learning, 17*(2), 105-119. Retrieved from Find it @ UFhttp://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34f09e2d096935499df4810cc99afe698f7de675892af08500&fmt=C

Thors, A., Dunki-Jacobs, E., Engel, A. M., McDonough, S., & Welling, R. E. (2010). Does participation in graduate medical education contribute to improved patient outcomes as outlined by surgical care improvement project guidelines? *Journal of Surgical Education, 67*(1), 9-13. doi:10.1016/j.jsurg.2009.12.002

Tod, A. M., Bond, B., Leonard, N., Gilsenan, I. J., & Palfreyman, S. (2007). Exploring the contribution of the clinical librarian to facilitating evidence-based nursing. *Journal of Clinical Nursing, 16*(4), 621-629. doi:10.1111/j.1365-2702.2006.01726.x

Todd, R. J. (2008). A question of evidence. *Knowledge Quest, 37*(2), 16-21. Retrieved from Full Text HTMLFull Text PDF HTML: http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34246f70f65fbf246687af4065c857e9b312ac139cc8d0d5bb&fmt=HPDF: http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34246f70f65fbf246687af4065c857e9b312ac139cc8d0d5bb&fmt=P

Toth, M. (2005). Research and writing and theses--oh my! the journey of a collaboratively taught graduate research and writing course. *The Reference Librarian,* (89/90), 81-92. Retrieved from http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34125f47fcd2b39c6674d1fd5d1a382906a58fb5b7444e37db&fmt=C

Tunon, J., & Brydges, B. (2006). A study on using rubrics and citation analysis to measure the quality of doctoral dissertation reference lists from traditional and nontraditional institutions. *Journal of Library Administration, 45*(3/4), 459-481. Retrieved from The author of this article has chosen the following Web sites:http://www.carnegiefoundation.org/Classification/CIHE2000/defNotes/Definitions./htmhttp://www.nova.edu/rpga/factbook/2005/http://www.edschools.org/pdf/Final313.pdf;

Tunon, J., & Brydges, B. (2009). Expanded assessment study examining the citation patterns from traditional and nontraditional institutions and their effect upon the quality of doctoral dissertation reference lists. *Journal of Library Administration, 49*(1), 137-159. doi:10.1080/01930820802312912

Turner, J. L., & McCaffrey, E. (2007). Library instruction for campus-based and distance faculty at Regis. *Colorado Libraries, 33*(3), 32-35.

Van Vuren, A. J., & Henning, J. C. (2001). User-education in a flexible learning environment — an opportunity to stay relevant in the 21st century. *South African Journal of Library & Information Science, 67*(2), 79.

Wagner, E. D. (2008). Realizing the promises of mobile learning. *Journal of Computing in Higher Education, 20*(2), 4-14. Retrieved from http://dx.doi.org/10.1007/s12528-008-9008-x

Wakimoto, D. K. (2010). Information literacy instruction assessment and improvement through evidence based practice: A mixed method study. *Evidence Based Library and Information Practice, 5*(1), 82-92. Retrieved from Find it @ UF http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34c9aabf518ccc3f8e102d5633b21ed22c3e88a0fcf8e40c5f&fmt=C

Watson-Boone, R. (2000). Academic librarians as practitioner-researchers. *The Journal of Academic Librarianship, 26*(2), 85-93. Retrieved from Full Text HTMLFull Text PDF HTML: http://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d3428a64628d64647f410c2d94a59712cd517eb058b772930da&fmt

Weaver, K. D., & Pier, P. M. (2010). Embedded information literacy in the basic oral communication course: From conception through assessment. *Public Services Quarterly, 6*(2), 259-270. doi:10.1080/15228959.2010.497455

Webb, P. (2006). Meeting the needs of distance education students: Creating an online-only library instruction course. *College & Research Libraries News, 67*(9), 548-550.

Weightman, A. L., & Williamson, J. (2005). The value and impact of information provided through library services for patient care: A systematic review. *Health Information & Libraries Journal, 22*(1), 4-25.

Wheeler, S. (2002). Student perceptions of learning support in distance education. *Quarterly Review of Distance Education, 3*(4), 419-429. Retrieved fromhttp://vnweb.hwwilsonweb.com/hww/jumpstart.jhtml?recid=0bc05f7a67b1790e70e397f5ebc28d34f09e2d096935499d7593eb230b80d71373acdc6878dadff3&fmt=C

Whipple, E. C., McGowan, J. J., Dixon, B., E., & Zafar, A. (2009). The selection of high-impact health informatics literature: A comparison of results between the content expert and the expert searcher. *Journal of the Medical Library Association, 97*(3), 212-218.

Winning, M., & Beverley, C. (2003). Clinical librarianship: A systematic review of the literature. *Health Information & Libraries Journal, 20*, 10-21.

Yin, R. K. (2009). *Case study research: Design and methods*. Los Angeles, Calif: Sage Publications.

York, A. C., & Vance, J. M. (2009). Taking library instruction into the online classroom: Best practices for embedded librarians. *Journal of Library Administration, 49*(1), 197-209. doi:10.1080/01930820802312995

Zhang, L. (2006). Effectively incorporating instructional media into web-based information literacy. *The Electronic Library, 24*(3), 294-306.

BIOGRAPHICAL SKETCH

Mary Edwards was born in 1979 in Gainesville, Florida, and received her primary and secondary education in Alachua, Florida. She attended college at Mercer University (Macon, Georgia) where she received a Bachelor of Arts in history, with a minor concentration in biology in 2001. After completing her undergraduate degree, Mary returned to Florida for her graduate degree. She holds a master's from the University of South Florida (2003) in library and information science.

After completing her library degree, Mary took the position of Distance Education Librarian in the University of Florida Health Science Center Libraries', where she worked her way up from an OPS (temporary) position to a Visiting position. Most recently in January 2011 she started her new position as an Assistant University Librarian in the University of Florida George A. Smathers Health Science Center Libraries.

Mary's research interests include instructional design, online teaching and learning, distance education, program evaluation, and new literacies including media, digital, and information. Shortly after beginning her career at the University of Florida, Mary made the decision to return to pursue a doctoral degree. She began taking courses in the College of Education in 2006 and entered the EdD program in curriculum and instruction (with a focus on educational technology) in 2008. Upon completion of the Doctor of Education degree, Mary will return to her position in the HSC Libraries working with distance education, library instruction, and program evaluation. Mary has been married to her husband, Eddie Edwards for 10 years. They have two daughters; Allison Elizabeth, who is eight years old and Samantha Hope, who is three years old.